EA-87-02

Ontario

ENVIRONMENTAL ASSESSMENT BOARD

VOLUME: 194

DATE: Wednesday, April 18th, 1990

BEFORE: A. KOVEN, Chairman

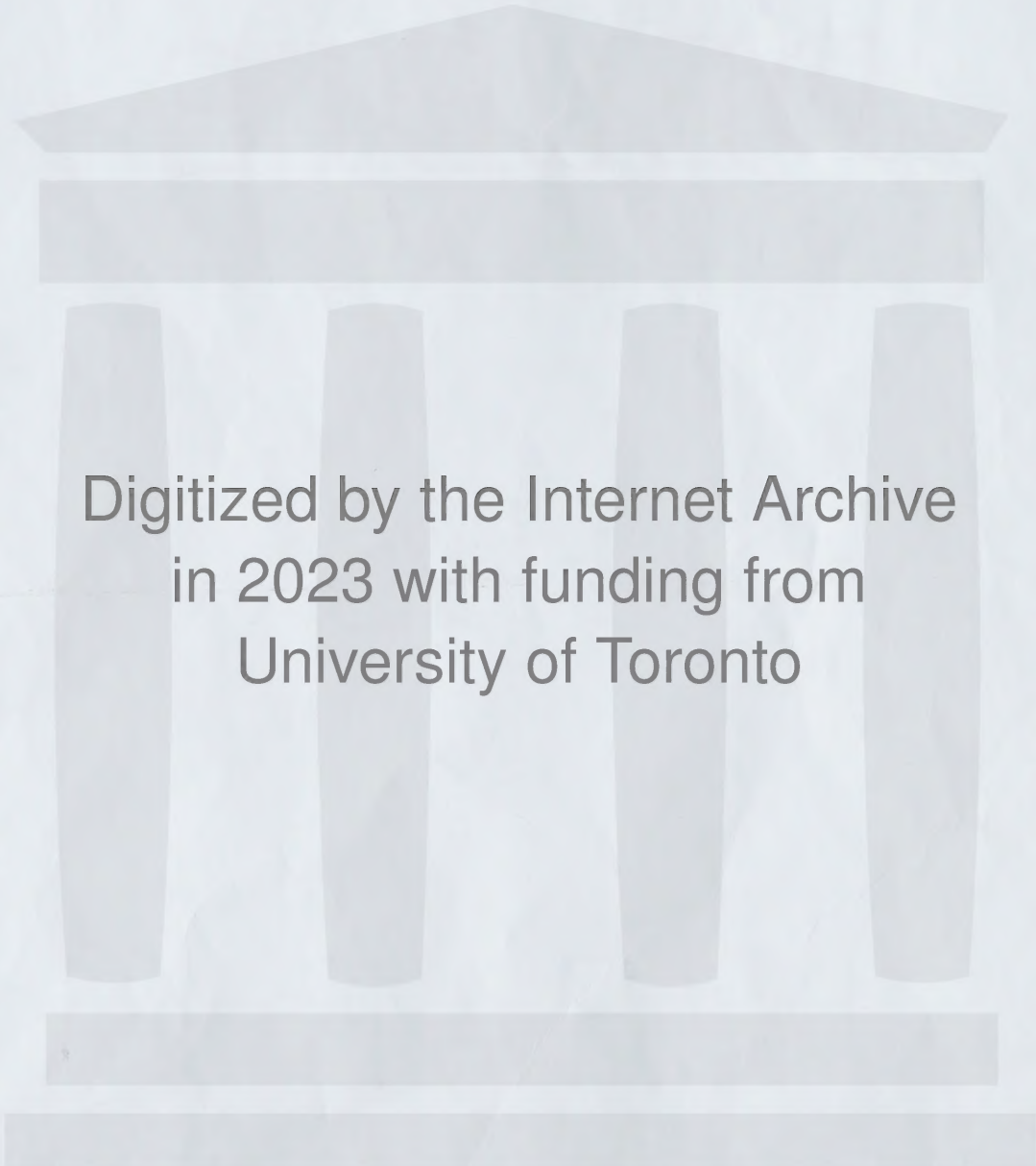
E. MARTEL, Member

FOR HEARING UPDATES CALL (TOLL-FREE): 1-800-387-8810

FARR & ASSOCIATES REPORTING INC.

(416) 482-3277

2300 Yonge St., Suite 709, Toronto, Canada M4P 1E4



EA-87-02

Ontario

ENVIRONMENTAL ASSESSMENT BOARD

VOLUME: 194

DATE: Wednesday, April 18th, 1990

BEFORE: A. KOVEN, Chairman

E. MARTEL, Member

FOR HEARING UPDATES CALL (TOLL-FREE): 1-800-387-8810

FARR & ASSOCIATES REPORTING INC.

(416) 482-3277

2300 Yonge St., Suite 709, Toronto, Canada M4P 1E4

EA-87-02

HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental Assessment for Timber Management on Crown Lands in Ontario;

- and -

IN THE MATTER OF a Notice by the Honourable Jim Bradley, Minister of the Environment, requiring the Environmental Assessment Board to hold a hearing with respect to a Class Environmental Assessment (No. NR-AA-30) of an undertaking by the Ministry of Natural Resources for the activity of timber management on Crown Lands in Ontario.

Hearing held at the Ramada Prince Arthur Hotel, 17 N. Cumberland Street, Thunder Bay, Ontario on Wednesday, April 18th, 1990, commencing at 8:30 a.m.

VOLUME 194

BEFORE:

MRS. ANNE KOVEN	Chairman
MR. ELIE MARTEL	Member

A P P E A R A N C E S

MR. V. FREIDIN, Q.C.) MS. C. BLASTORAH) MS. K. MURPHY) MS. Y. HERSCHER)	MINISTRY OF NATURAL RESOURCES
MR. B. CAMPBELL) MS. J. SEABORN) MS. B. HARVIE)	MINISTRY OF ENVIRONMENT
MR. R. TUER, Q.C.) MR. R. COSMAN) MS. E. CRONK) MR. P.R. CASSIDY)	ONTARIO FOREST INDUSTRIES ASSOCIATION and ONTARIO LUMBER MANUFACTURERS' ASSOCIATION
MR. H. TURKSTRA	ENVIRONMENTAL ASSESSMENT BOARD
MR. E. HANNA) DR. T. QUINNEY)	ONTARIO FEDERATION OF ANGLERS & HUNTERS
MR. D. HUNTER) MS. N. KLEER)	NISHNAWBE-ASKI NATION and WINDIGO TRIBAL COUNCIL
MR. J.F. CASTRILLI) MS. M. SWENARCHUK) MR. R. LINDGREN)	FORESTS FOR TOMORROW
MR. P. SANFORD) MS. L. NICHOLLS) MR. D. WOOD)	KIMBERLY-CLARK OF CANADA LIMITED and SPRUCE FALLS POWER & PAPER COMPANY
MR. D. MacDONALD	ONTARIO FEDERATION OF LABOUR
MR. R. COTTON	BOISE CASCADE OF CANADA LTD.
MR. Y. GERVAIS) MR. R. BARNES)	ONTARIO TRAPPERS ASSOCIATION
MR. R. EDWARDS) MR. B. McKERCHER)	NORTHERN ONTARIO TOURIST OUTFITTERS ASSOCIATION

APPEARANCES: (Cont'd)

MR. L. GREENSPOON) MS. B. LLOYD)	NORTHWATCH
MR. J.W. ERICKSON, Q.C.) MR. B. BABCOCK)	RED LAKE-EAR FALLS JOINT MUNICIPAL COMMITTEE
MR. D. SCOTT) MR. J.S. TAYLOR)	NORTHWESTERN ONTARIO ASSOCIATED CHAMBERS OF COMMERCE
MR. J.W. HARBELL) MR. S.M. MAKUCH)	GREAT LAKES FOREST
MR. J. EBBS	ONTARIO PROFESSIONAL FORESTERS ASSOCIATION
MR. D. KING	VENTURE TOURISM ASSOCIATION OF ONTARIO
MR. D. COLBORNE) MS. S.V. BAIR-MUIRHEAD)	GRAND COUNCIL TREATY #3
MR. R. REILLY	ONTARIO METIS & ABORIGINAL ASSOCIATION
MR. H. GRAHAM	CANADIAN INSTITUTE OF FORESTRY (CENTRAL ONTARIO SECTION)
MR. G.J. KINLIN	DEPARTMENT OF JUSTICE
MR. S.J. STEPINAC	MINISTRY OF NORTHERN DEVELOPMENT & MINES
MR. M. COATES	ONTARIO FORESTRY ASSOCIATION
MR. P. ODORIZZI	BEARDMORE-LAKE NIPIGON WATCHDOG SOCIETY

APPEARANCES: (Cont'd)

MR. R.L. AXFORD	CANADIAN ASSOCIATION OF SINGLE INDUSTRY TOWNS
MR. M.O. EDWARDS	FORT FRANCES CHAMBER OF COMMERCE
MR. P.D. McCUTCHEON	GEORGE NIXON
MR. C. BRUNETTA	NORTHWESTERN ONTARIO TOURISM ASSOCIATION

INDEX OF PROCEEDINGS

INDEX OF EXHIBITS

---Upon commencing at 8:30 a.m.

MADAM CHAIR: Good morning. Please be seated.

MR. CASSIDY: Good morning, Madam Chair, Mr. Martel.

MADAM CHAIR: Good morning, Mr. Cassidy.

Before we begin I wanted to inform you and the other parties that Mr. Hanna will be cross-examining tomorrow, that the Board has given leave to Mr. Hanna to do this and we are sending him a short letter this morning and I will read that into the record for your information.

"Dear Mr. Hanna: The Board has granted you leave on behalf of the Ontario Federation of Anglers & Hunters to cross-examine the witnesses on Panel 6 of the forest industry case.

However, the Board requires that you make a commitment in writing that you will meet all future deadlines with respect to scoping and other matters. The conduct of your party has become an issue in terms of expediting this timber management hearing. Your apparent inability to meet scheduling deadlines

is causing inconvenience to other parties and to this Board. You must be aware that the Board will not grant leave automatically to cross-examine if you continue to ignore deadlines for statements of issue. Therefore, the Board requires that you deliver your letter of commitment on Thursday, April 19th. This letter will be read into the record."

MR. CASSIDY: Madam Chair, just on one other matter. I have spoken to the witnesses and all of them have indicated they are prepared to come back on May 1st should that be necessary to complete this panel and, therefore, it will be unnecessary to have us all return for a short period of time next week, so that we can all plan and proceed on that basis if the Board is prepared to do so.

MADAM CHAIR: Yes, we are, Mr. Cassidy.

MR. CASSIDY: Thank you.

GARY MacKAY,
IAN ROBERT METHVEN,
DONALD B. HOPKINS,
WILLIAM J. ROLL,
DONALD R. JOHNSTON,
PETER MITCHELL MURRAY, Resumed

MR. CASSIDY: I would then like to

commence this morning by going back to Mr. McKay just briefly.

CONTINUED DIRECT EXAMINATION BY MR. CASSIDY:

Q. Mr. McKay, yesterday we heard your colleagues Mr. Johnston and Mr. Roll talk about equipment developments and changes and Mr. Johnston indicated that he expects equipment developments to continue, change and improve.

I wonder if you are able to indicate what direction you believe those developments will be in?

MR. MacKAY: A. Yes, Mr. Cassidy. I see that the development of this equipment will go towards more efficiency in a purely productive manner, but also further in minimizing the site disturbance as a result of such developments as smart hydraulics as Mr. Roll has spoken of, and also lower ground bearing pressures as Mr. Hopkins had described yesterday.

Q. Thank you. If I could then move on to Mr. Roll and if we could pick up where we left off yesterday in respect of Section 7 of the statement of evidence, and if the next overhead could be put up. That overhead can be found on page 39 of Exhibit 1121.

Mr. Roll, if you could please read that into the record for the benefit of the Board?

MR. ROLL: A. Yes.

"It is the Industry's position that efficient, properly managed harvest operations are environmentally sound activities."

Q. Could you please summarize this segment of the evidence, please?

A. Yes, I can. The industry manager uses his experience in his area, his knowledge of his operations and his equipment, as well as his knowledge of local conditions to plan all of his activities in an efficient and operationally and environmentally sound manner.

He applies the various guides and guidelines and manuals and so on in a manner that is, is his experience, relevant to the kind of local conditions that he faces on his operation. He adopts practices or methods of operation within the bounds of the various approved timber management plan, the forest management agreement, the silvicultural groundrules and so on, as well as relevant guides and guidelines and manuals which practices -- which promote both operational and environmental efficiency.

I can't emphasize strongly enough, the Industry believes that it is in its own interests to maintain the viability of the site to allow for a

successful renewal treatment.

Q. And could you assist us with evidence from the case study Exhibit 1100, your case study found at Tab 4A.

A. Yes, I can. I would like to refer back to several things that I mentioned yesterday in the course of our discussions of yesterday and the issue of equipment development.

We pointed out there -- or I point out there the development of the K220 and K330 feller bunchers which Canadian Pacific Forest Products played a major role and the fact that it was for good operating sense in that we were developing equipment that was -- could be applied to the sites that we work on, but also it had a benefit as well in that that equipment is sensitive to the sites on which it operates.

I also talked a little bit yesterday about the development of tires, having to do from oversized radials through to smooth tires mounted on large rims. All this obviously has an operational benefit in that we don't become bogged down and stuck. It also, obviously, has a benefit for the site.

I also mentioned yesterday two things having to do with the planning of our operations and

the first was the fact that we do place our operations, in the case study for example, in a well drained area in the spring. Again, it makes operational sense, but it also makes environment sense. It makes sense to the site; there is far less site disturbance. Also, the fact that during the period of this case study we did move out and back in. We moved out to a more sensitive site during a dry period.

Those are the kinds of things that we do normally in the course of our activities and they do make operational sense, but they also make good sense in terms of minimizing any impacts, any disturbance to the site.

Q. And, Mr. Hopkins, I understand you wish to refer the Board to some parts of your case study found at Tab 4D?

MR. HOPKINS: A. Yes, I do, Mr. Cassidy. As the Board knows, on the Clay Belt the consideration of sites, stand conditions is vital to the choice of harvesting and renewal activities. Referring again to Exhibit 1100, case study D on page 26...

Q. Just hold on a minute, please.

A. And looking at the three paragraphs under method of harvest, each paragraph concisely describes what was done on the case study areas in our

case study and I would like to make note of the fact that block A, which was an upland clay site, was cut during the frost-free season at a time when no unnecessary disturbance to the site would be caused.

Block B, which was a low land site, was cut during the winter and block C, another lowland site, was also cut during the winter and I would like to make a point that this demonstrate that there was good rationale on the part of field personnel and planning of the harvest of those areas.

The protection of soft sites is controlled by the front line supervision on a day-to-day basis and this can be seen in our decisions to routinely defer soft sites encountered during the open season and defer them to the winter time, or another method that front line supervisors can use is to choose the more appropriate forwarding system such as -- if they unexpectedly encounter a soft site during the frost-free season, instead of allocating that area to a grapple skidder they could allocate it to a Lokomo forwarder because they know that a Lokomo forwarder is able to operate on softer sites causing less site disturbance.

The Board has already seen and heard in the access panel the road and bridge construction

activities are carefully done and appropriately designed for the sites encountered on the Clay Belt. I would like to refer to Exhibit 68 which is the forest management agreement review, five year review from 1980 to 1985 and the audit team is -- on page 34 makes the following comment:

> "Roads and bridges are undertaken with care and do not appear to have adversely impacted upon the natural environment."

I would like to point out that this is typical of our approach. If we're mucking around in the mud that's a problem for us, it just makes everything harder and it certainly isn't efficient. We realize that guideliness exist, that they're necessary and we ensure that our operations are conducted accordingly.

Q. Mr. Murray?

MR. MURRAY: A. Yes, Mr. Cassidy.

Q. Make sure your mike is on, please.

A. Madam Chair, Mr. Martel, good morning. I would like to refer you to the case study binder, 1100, Tab E, page 26 -- bottom of page 26, top of page 27.

This is the section where we -- paragraph where we are describing the effects of environmentally

sound and efficient operations. In addition, I would like the Board, if they would, to refer to Exhibit 1101 which is I think your package of photographs. Again, this will be case study E and photograph 6.4. I will make reference to it in a moment.

First, I would like to mention, with regard to the harvesting aspect of felling, when the cutter or the feller has the option he will directionally fall a tree to reduce the possibility of damage to residual trees and/or to advanced regeneration. This isn't always possible because safety is a prime factor, but where it can this will be done.

The use of trails and location of trails is an important part of an efficient operation. By locating a trail in the best site for the skidding and the access to the timber, the trail locater, the technician can reduce potential damage to the -- again to the residual trees and to the site by reducing the angle of the approach to the man-made trail.

The photograph that I referred to, if you could look at it, you will notice this is a winter photograph of an area similar to the case study area, tolerant hardwood maple working group. The main road is seen at the top of the photograph.

The tree-like branches that are off it, that are proceeding from it are trails and these are in declining size and content and are the skids trails to the individual patches of harvested timber. By reducing the angle, then there is no need to pivot a tree or hitch trees around a tree and causing damage to that tree.

Another efficient system and method is the reduction or limiting of the size of the hitch which is the group of trees that have been picked up the by the skidder operator. If he becomes over-ambitious and puts too many trees on his hitch he is going to have a problem in making up small -- travelling up he will have to stop, winch, he will be required in many cases to winch and to pivot around small trees or larger trees and could damage future crop trees; therefore, by reducing it he can move easily out to the landing without stopping and starting, as well as -- which creates the possibility of site disturbance from the wheels.

Q. Mr. McKay, could you assist the Board with respect to your case study at Tab 4B of Exhibit 1100?

MR. MacKAY: A. Yes, Mr. Cassidy. I would like to give one example from case study 4B,

Exhibit 1100 on page 13, section 6.3, the second paragraph down and the last few lines of that paragraph:

"A main skid trail was then cut from the back end of the harvest block forward to the skidway, usually by progressively felling trees with butts facing the road for easier skidding.

The reason we do this is twofold. First of all, it minimizes site disturbance by using a singular trail and also - present there are unwanted poplar species - the reduction of suckering from stumps if we were skidding various trails all over.

I would also like to give a couple of examples other than the case study which we have carried out in the last several years.

We have come upon a previously unidentified osprey nest in one of our road right-of-way cutting operation and we marked that area off and did not allow any cutting that area at the time to accommodate the occupants.

Also, as Mr. Hopkins has also described, we do have designated winter cut areas. In our situation it's usually lowland spruce areas that will be very inefficient if at all possible to harvest

during the summer time and we will designate these areas strictly for the winter time when we can get at the wood and we do not disturb the site.

Thirdly, in isolated cases we have returned to residual stands of jack pine that we previously bypassed and as we return the area is surrounded by advanced regeneration and, once again, we will mark skids trails and confine the skidding to those trails to minimize the disturbance of the regeneration.

As I mentioned yesterday, we do not have a lot of experience with extra wide or oversized wide tires as Mr. Hopkins does, but we have had occasion to use these particular pieces of equipment. In grassy wetland areas that were surrounding jack pine stands, we had installed these extra wide tires on their machines, harvested the wood and taken the tires off when we finished that particular block.

Finally, we have also changed our schedule in another situation with jack pine stands surrounded by very wet areas that we originally planned to harvest in the summertime, but on investigation of the site we realized this involved backfilling roads across these grassy wetlands to access these so-called islands of jack pine.

We would do this from borrow pits or what we call pit run materials, sand, gravel composition and because of the -- it's also very expensive and detrimental to the site, we decided to change our scheduling and harvest that particular area in the wintertime. By doing this we were able to construct the road of ice and snow and harvest the area and haul the wood out of there and very minimal disturbance was experienced because of that. That particular area was then prescribe burned and aerial seeded so it was not accessible in the summertime.

Q. Thank you.

MR. CASSIDY: Now, Madam Chair, what I would like to do is -- that completes Sections 1 through 7 of the evidence and I would now like to turn to each of the witnesses who is here in respect of their case studies and ask them to provide you with a brief overview of the harvest activities that are referred to in each one of these case studies and it will be necessary to refer to some slides and, therefore, I would ask that the overhead be turned off.

The first witness I would like to turn to is again Mr. Roll in respect of the case study found at Tab 4A.

Q. Mr. Roll, perhaps you can begin by

indicating, by use of a slide, just briefly where the case study area is again and the harvest activities that occurred on the case study area?

MR. ROLL: A. Yes, I would like to use a slide just to relocate the case study area.

Once again, this is the English River forest, Canadian Pacific Forest Products.

Q. You are referring to slide 2.1; is that right?

A. I am referring to slide 2.1 of case study 4A, Exhibit 1100. Thunder Bay on this slide is found in this location in the lower right-hand side of the slide.

The main transportation corridors, again, are Highway 17 and the Canadian Pacific Railway running diagonally up to the upper left-hand side of the screen. The English River forest is this area outlined in purple on this slide in the upper left and the area of the case study is in this location in the extreme northwest side of this slide.

All the wood harvested off the general case study area was moved to a spur in this location and then on down the Canadian Pacific Railway to our mill in Thunder Bay.

This is slide 2.6 from the case study 4A

and in a little more detail it locates the case study area in the the upper right. The main transportation corridor, Highway 11 -- Highway 17 and the Canadian Pacific Railway running diagonally across the bottom from the lower right to mid left and the main access corridor going north from the highway and the railway into the case study area.

The location of the camp that directed all the activities is here, approximately three miles to the east of this case study area. That's all I will require of the slides right now.

I would like to refer the Board now back to the case study itself at Tab A, Exhibit 1100, page 17. Beginning at this page we discuss a couple of -- well, three major planning considerations in the general planning for opening up the entire area of the case study; that is, the whole area that was harvested out of what was then Camp 328, the camp responsible for harvesting the case study.

One of the primary planning considerations in terms of timber and harvest was the age-class distribution in the timber immediately surrounding that camp area and the harvest area. The general principle was that we were going to be cutting oldest timber first.

It happens that much of the oldest timber was also some of the more distant timber from camp and it was unaccessed. So as we developed the area we had our road systems directed towards these concentrations of oldest timber. There were to the -- generally to the west, to the north and to the east of the camp location.

Obviously we couldn't access everything at once and then go in and harvest all the oldest timber first, so there was a balance of harvesting some of the older material away from the camp as well as some of the younger age classes near the camp, including the case study area which, I remind you, was 75 years old at the time of harvest.

To go along with that planning consideration there was another wherein we wanted to attempt to access and harvest all of the furthest timber first. There are several considerations here. We obviously didn't want to effect the operations in a way that we were working always a long way from camp in the early years of opening the camp. So, again, there was a balance of further out wood and closer to camp wood including the case study area, but generally we did want to harvest the furthest out timber first.

This was a consideration because in the

area of the case study we are approximately 50 to 60 miles from Dryden and about the same from Ignace and we felt that if we could harvest the furthest out timber at the beginning that we would be left with timber that would be accessible by commuter operations from either of those communities in the future. So that was another main planning consideration and how we opened up that particular area.

Another consideration, a general consideration that we used when we were developing the area was that we had many stands of the type that are described in the case study; that is, younger age class jack pine growing on upland sites. Because of the nature of these stands - I believe you have heard the term before - they could be stored on the stump, they could have standing inventory at roadside.

The country generally sandy and well draining soils, the roads tend to hold together for longer periods of time and rerouting the access to these stands would be a minimal problem.

We also believe that most of those stands would be the stands that we could come back to with commuter operations when we changed our operations over to that style. And I guess another consideration in laying out those -- the block cut on concept was one of

wildlife considerations in that it was an area reasonably close to a number of communities and it was an area that was -- had been traditionally high use for hunting, particularly for moose.

So we laid out a block cut pattern only in those younger age class jack pine that could be stored on the stump and the configuration was blocks, approximately 50 hectares to 150 hectares. The plan was to return to those, to cut the standing timber when the material in the cut-overs was in the free to grow. At that time that was our intent.

I would like to now remind the Board that we are talking here of the jack pine upland cover type. The stands in the case study area were both in the jack pine working group, both from fire origin and they were both growing on deep soils, sandy soils or sandy silty sands and that type of material. The area that was harvested was 121 hectares. The silvicultural system used was clearcut. The entire 121 hectares had the clearcut silvicultural system applied.

The alternatives that we had are described on page 20 of Exhibit 1100, the alternatives to harvest.

Q. Page 20 of Tab 4A of Exhibit 1100?

A. Of Tab A, yes.

Q. Yes.

A. We had two harvest systems to choose from in the camp. Both these harvest systems had been developed over time to be able to harvest on the range of sites that we had in the English River Forest.

They were the conventional cut-and-skid operations, and this was 10 -- there were 10 crews. These are three-men crews, two cutters with power saws and one skidder operator with a wheeled skidder. And 10 of these crews work in a group, they work in a garage -- garage site, a portable garage under a full-time supervisor. That was one option.

The other option I described briefly in the case study overview was the Koehring shortwood harvester operation. This was a shortwood to roadside operation, entirely mechanized.

The group at camp 328 was composed of five of these machines working on a double-shift basis, again from a fully portable garage site.

The Koehring shortwood harvester I remind you cut both in the felling phase as well as cutting the wood to length using shears. So this became a consideration in the choice of our harvest system.

The ground and terrain in the case study area being of the sandy nature, it would support either

kind of a system. That was not a consideration in making the decision. But the jack pine was of extremely good quality, being younger age-class jack pine, and the stud mill required this kind of quality. The stud mill is a sawmill and very sensitive to the quality of the product that it gets.

With the nature of shears, they're hydraulically driven through the tree, there is some splitting of the ends of the logs as they are cut to length. This splitting would downgrade the quality of the log in terms of the stud mill requirements.

The cut-and-skid operation on the other hand utilized a power saw, there was no butt damage at all in the felling phase and it utilized the slasher, three-man mobile slasher to cut those -- the tree length to length.

So because of the considerations involving stud mill material, we decided to apply the cut-and-skid operation in that area followed by roadside slashing.

We began the operation, as I have described several times, in the spring of '81 and I have described the reasons for being in there in the spring. We moved out during June and back in during the fall to complete the harvest of that 121 hectares.

I would like to describe briefly for you through a number of slides that cut-and-skid operation or an example of a cut-and-skid operation. The detail is found in the text from pages 21 to 28 of Exhibit 1100, Tab A and I would like now to go to some slides from that same case study.

MR. CASSIDY: The Ministry of Natural Resources is making an attempt to find a replacement bulb which we think is the technical difficulty plaguing us at the moment.

---Discussion off the record

MADAM CHAIR: Could the Board ask the parties what happened last night when you had the decision about Ms. Swenarchuk's proposal?

MS. SWENARCHUK: We essentially reached agreement on them and I was to speak to you later in the day about that, if that is agreeable.

MADAM CHAIR: All right, fine.

MR. CASSIDY: There were actually a number of matters that we wish to speak to you about and it would probably be, in terms of time, worthwhile to deal with all those at the end of the day either during or after the scoping session.

MADAM CHAIR: Yes, we will do it after the scoping session then.

MR. CASSIDY: Thank you.

Q. I think we are in a position to continue now the light bulb has been replaced on the slide projector. Mr. Roll, carry on.

MR. ROLL: A. I am not sure that that slide is as well as it could get with that set of lights out.

Thank you. This is slide 6.2 from the case study 4A. It's a close-up of a power saw operator using a power saw to notch, put a notch in jack pine, The operation, as is described in the case study, the operation of notching and felling a tree safely is not one that can be taken lightly. It's an extremely dangerous operation and also one that if done properly can make the cutter and the crew far more efficient. So it's a skilled job. So this is 6.2, it's a close-up of the notch.

This is slide 6.3, a little bit wider vision or wider view of the cutter making that notch.

This is slide 6.4, the cutter has completed the notch, completed a back cut which is a cut through the other side of the tree to allow it to fall, and he's just stepping back and keeping his eye on the tree as it's falling.

This is 6.5, another view of the same

part of the operation, again in a jack pine stand. The cutter being careful to watch the tree in case it should make any kind of a movement back towards him or if any debris should fall.

This is slide 6.6, it's a view of a -- the cutter now, the felling has been completed and he's out taking the limbs off the trees with a power saw and topping the trees.

This is 6.7, another view of the limbing operation and, as you can see, there's quite a tangle of branches and debris in the area that he's working and again I point out it is a skilled job and one that cannot be taken too lightly.

A view of a skidder just backing into what we call the face or the working area of a cutter.

Q. This is slide 6.8?

A. This is slide 6.8. The cutter is standing behind some standing timber out of the way in case trees are rolled back or rolled over to ensure that those trees wouldn't hit him.

Q. I am sorry, is that 6.8 or 6.9?

A. That was 6.8. This is -- I am sorry, that was 6.9.

Q. And this is...?

A. This is 6.10. This is a skidder with

a load. The skidder has the load winched up and off the ground in behind the fairlead or the raised part of the skidder at the rear of the skidder.

That is this area in the middle of the picture, and there is a winch cable, a cable that goes over that and chokers that around the trees here, and when the operator activates the winch it pulls in the trees and pulls them up towards the fairlead.

This is a picture of a skidder at a skidway or where he's piling down the tree-length material. It is photo 6.11.

Q. I just want to go back to photo 6.10, the one you were just looking at.

A. Yes.

Q. And the fairlead that you are referring to, is that what is mentioned on page 40 of the witness statement?

A. Yes, it is.

Q. And that is in the second full paragraph?

A. Yes, that's right.

Q. What is the effect of pulling the load to the fairlead?

A. Well, by pulling the load into the fairlead you are raising the butts of the tree-length

off the ground. It makes for more efficient skidding in terms that you are not dragging a whole tree on the ground. As well, it would minimize any ground disturbance because you are lifting those butts off the ground.

Q. I am sorry, you were now on 6.11?

A. Yes. This is back to slide 6.11. The skidder operator is using the blade of the skidder to straighten the front of the skidway.

As you will see in later photographs there is another operation of slashing which follows this and it's important that that pile is in reasonable order for the skidder to be -- or for the slasher to be able to operate there.

This is Figure 6.12 and it's a picture of a completed skidway or a pile of tree-length jack pine along a roadside and this is ready for the next operation.

I would like to turn now to another kind of operation I mentioned in the case study overview that one of the reasons this case study was chosen was that we were able to describe for you, and we have done so in Appendix A of case study 4A, a modern Koehrinh feller forwarder full-tree operation. I have a number of slides of that type of an operation and would like

to just run through those now.

As I say, the full description of this kind of an operation would be found in Appendix 4 at Tab A, Exhibit 1100. This is photo 10.1 from the case study.

MR. CASSIDY: Appendix 4, Madam Chair, can be found at page 66 of Tab 4A just for your reference for your notes.

MR. ROLL: This is a slide of a Koehring feller forwarder, a close-up of the head and the bottom of a feller forwarder just after it's cut. The two trees that are in the arms are being held by the head.

The dusty appearance about halfway -- about the middle of the photo, the white appearance is snow. There is a spinning disc saw blade that does the felling cut on this machine and in snow conditions, as it turns and encounters snow. You will see that kind of a cloud.

This is photo 10.2, it's another view of a forwarder, a little wider view, a feller forwarder. The operator here has a tree and is just dropping it into the bunk at the back of the forwarder. He accumulates his load of full-tree in this bunk and then proceeds to roadside.

This is photo 10.3. The Koehring feller

forwarder has a hydraulically controlled bunk. There is a large cylinder at the back of the machine and when he has a full load proceeds to roadside, just activates that cylinder and keeps walking out from under the load.

This is photo 10.4. It illustrates a number of such piles at roadside. This is now ready for the second operation, the delimbing operation.

This is slide 10.5. This is an older piece of equipment. This is a shot of the equipment that was -- the kind of delimber that was actually used in the case study area. It's a Koehring bantum tracked carrier equipped with a Roger boom delimber and the delimber strips the limbs off the wood and -- off the trees and cuts the top.

This is photo 10.6 and I have just inserted it to illustrate that we have developed equipment as we proceed. What we did here was take an old Koehring feller -- Koehring shortwood harvester. The shortwood harvesters because of their shears and because of their age were being retired. We took the chassis off one of these - and actually we have done this on a number of machines - we bought some components from Koehring Canada and built a delimber out of it.

Some advantages in terms of operator comfort compared to the older machines, and --well, operator comfort and safety, as well as the productivity is much better on this type of machine.

I believe the Board saw equipment like this during its Dryden site visit at the Canadian Pacific Forest Products camp 39.

After either of these operations the next operation is the operation of slashing the tree-length piles that are at roadside to length. The full description of slashing is found -- can be found in detail beginning at page 28 of Tab A.

I will just show two slides of that operation. This is photo 6.13. It's a three-man slasher. The tree-length material here is fed into a trough at the bottom of the machine here. There is -- you can see in this slide there are two cabs, there is one here and one here (indicating) also hidden by those two cabs there is a third cab at the back of the machine.

The man in this cab activates the trough, forwards the wood to the saw, the saw cuts the wood, the wood falls down into a trough that is just hidden over in this location (indicating), then this operator unloads the shortwood and piles it down on this side of

the road.

So the tree-length from this side of the road is processed and piled back down on this side of the road. The trend in Industry is to get away from these types of large slashers and towards one-man slashers which are a lot smaller and a lot simpler than a machine like this.

Again, I believe the Board viewed a slasher during its Dryden site visit.

I would like now to turn to the haul. Again I don't think we have talked a lot about this aspect of our industry and I guess it's difficult to see where it fits into some of the activities we have described as harvest, renewal and so on, but it is an essential part of our operations, and generally the haul is considered to be part of our woodlands operation responsibility.

I have again a number of slides to illustrate. I begin with -- or this is slide 6.14. It's wood at roadside after slashing and just before the haul.

Slide 6.15, this is a view of a modern bush haul truck. This is the kind of haul truck that operates only on bush roads. It wouldn't be a licensed truck, it would be too large for a licensed truck, so

it operates only on our bush roads. Heavy duty truck and trailer.

View of an empty truck on a primary haul road.

Q. What slide number is this?

A. This is slide 6.16. A view of a haul truck being loaded. In behind the truck there is a tracked knuckleboom motor. The body of the loader is here, you can see the bottom here, and it is loading the 8-foot wood or the 254-centimetre wood on the trailer of that truck.

Q. This is slide number...?

A. 6.17. Slide 6.18, this is a loaded truck. You can see on top of the load the operator here is straightening some of the sticks that are along the top of the load ensuring that he's got an even load at the top.

He also takes some chains or cables and runs them back over the load to ensure that the load is well secured prior to moving away from the loading site.

This is 6.19. It's a view of a truck, a full truck, a loaded truck that has just entered a spur area or a railway spur area.

This is 6.20, it's a view of a front end

loader unloading a truck. The wood can then either be piled down at the spur or loaded directly on to rail cars. In either case the loader operator would use a device like this.

This is slide 6.21, it's -- we call it a squeeze. Just to describe what it does -- and it's purely mechanical, it's not powered in any way. It just uses the weight of the wood, the weight of the clam. As the operator drops his clam into this machine the two plates at the side -- that's this plate and this plate (indicating) --

Q. You are referring to the side panels of that piece of equipment?

A. Yes, I am. They come together and they even up the ends of the wood. This makes it easier to load into the rail cars, as well as, if he puts that directly in the pile and it's that straight he can remove it from the pile that way in order to reload the rail cars at a later date.

This is 6.22, it describes the front end loader loading a rail car.

And this is 6.23, it's a series of loaded rail cars ready to be picked up by the railway and forwarded to the mill. That is all the slides that I have.

The entire operation, as I stated in the overview, was supported by a major camp facility. We employed full-time approximately 90 men to support these operations to actually do the operations and to support them.

All the wood that we did cut off the harvest from the case study area was taken to Thunder Bay to be utilized at our mill there.

Q. And what were you manufacturing at that mill?

A. Out of those products it would be kraft pulp, lumber and newsprint.

Q. Thank you, Mr. Roll.

Mr. Hopkins, I would like to move on to you in respect of case study 4D found at Exhibit 1100 and ask you to provide an overview of the harvesting activities to the Board.

And I would ask you to commence by just re-orienting us as to where your case study is on the map. I understand you wish to refer to Exhibit 1105 to do that?

MR. HOPKINS: A. Yes, I will. I am referring to Exhibit 1105. The case study area, case study D is located in the Clay Belt area of the undertaking.

The case study referred to is located right there, which is about 80 kilometres north of the Iroquois Falls mill and the Iroquois Falls mill is located in the Town of Iroquois Falls in the southwest corner of our licence of the FMA.

Q. Which is highlighted in yellow in Exhibit 1105?

A. The FMA is highlighted in yellow, yes. All the wood produced on the case study areas referred to in the case study was delivered to the Iroquois Falls mill and was utilized in the making of newsprint.

The silvicultural system in place, as described in the case study, was the clearcut silvicultural system demonstrating both artificial and natural regeneration techniques used. In our opinion, this was the appropriate silvicultural system for the case study sites and Dr. Methven will be providing detailed evidence on silvicultural systems in his evidence later.

The rationale for the regeneration alternatives will be explained by Mr. Gemmell in the renewal panel following.

I will just review the harvest systems in place. Prior to the 1970s, the harvesting system was

manual felling with chain saws, utilizing horses and cable yarders forwarding 16-foot wood. At the time of the case study in 1979/80 the harvesting system was tree-length harvesting by manual falling of chain saws and delimbing and use of -- and forwarding with conventional cable skidders equipped with 24-inch wide tires. At the time of the case study this was the appropriate harvesting systme for the sites and species involved.

A rational decision was made with respect to the timing of harvest to facilitate the regeneration method in light of the harvesting system in use. Today the harvesting systems available allow a broader range of choice. In addition to choosing the timing of harvest of lowland sites, a supervisor can also select high flotation equipment to best suit these sites as they are encountered.

The development of full tree mechanized harvesting equipment has resulted in safer, more comfortable working conditions, as well as reducing impact on our sites.

I have chosen three photographs to illustrate some of the points covered, if I could have the lights. This is from Exhibit 1101, case study 4D.

Q. Photo number?

A. 7.9. This shows the wide high flotation tires now used on all our cable skidders during the frost-free season and I believe the Board members saw these tires equipped on skidders at the Spruce Falls operation on the Kapuskasing site visit.

I would like to point out the rack on the back of that machine that the supervisor is touching. That rack is used during the summer tree plant for transporting trees to the planters. That particular modification resulted from employee and supervisor suggestions and since then we have built several of these and that has become our normal method of transporting trees on the tree plant operation and this is just a small example of the integration I was referring to at the start of our presentation yesterday.

This is photo 6.8 and I've just put this photo in to indicate the advanced growth I've been referring to. The advanced growth can be seen in this photograph as the small trees in the foreground. These trees have been left after the harvesting has taken place and you can see the feller buncher that's working in the background in the top right-hand corner.

The development of the mechanized full tree harvesting systems that we have now have allowed

us to protect this advanced growth on certain sites and we were able to use that, protection of the advanced growth, as a natural regeneration technique. I believe the Board also saw this technique being used in Kapuskasing Spruce Falls operation and they call this technique HARO.

This is photograph 6.11. Again, these are high flotation tires, however, they are mounted on a grapple skidder. The grapple is the clam device that we are looking at at the back of the machine. I use this photograph to emphasize the fact that our supervisors and employees know that a grapple skidder is -- because of its weight distribution is not able to work on as soft a site as a cable skidder equipped with wide tires.

This is a very fine distinction that may not be known by people not directly on the ground working with this type of equipment on a day-to-day basis. However, it is used by the supervisors and employees in their judgment of the best appropriate use of the harvesting systems that we have available to us.

Q. Mr. Hopkins, can I take you back to slide 6.8 for a second. What is the white material pictured in this photograph?

A. That's snow.

Q. Thank you. It's not rock?

A. No, that's a lowland spruce site and it is harvested during the snow -- during the winter.

Q. Great. Thank you.

A. This is photo 6.13. This is a shot of a Lokomo clambunk forwarder that I've been referring to. Presently we have four at a total cost of $1.7-million. These machines exert a lower ground pressure than conventional tired skidders equipped with wide tires or grapple skidders equipped with wide tires, as well as exerting less ground pressure they reduce the amount of travel on the sites. They now form an integral part of our silvicultural and harvesting systems.

It has been our experience that the flexibility to utilize in a wide range of harvesting alternatives will encourage further positive developments in harvesting equipment.

Q. Thank you, Mr. Hopkins. If I could then turn to you Mr. Johnston in respect of case study 4C, Exhibit 1100, the Abitibi-Price Lakehead Woodlands case study and ask you to describe the harvesting activities that occurred on that case study.

I would first ask you just to reorient us again by way of reference to Exhibit 1105 where your

case study area is, and I don't believe you have any slides to show in this so we can turn the lights on?

MR. JOHNSTON: A. Yes, Mr. Cassidy. Madam Chair, the Spruce River Forest is located right here on the map, it's the upper left-hand portion of the map. It is highlighted in yellow and the case study area is located at the top of the dot.

The case study is approximately 30 miles north of Thunder Bay which is located directly below the Spruce River Forest and the Wolf River Road which I will be referring to runs right along the bottom of the Spruce River Forest.

The Wolf River Road was originally built by Abitibi-Price as a harvest road. The Ministry of Natural Resources took over responsibility for this road in the 1960s and it then became a forest access road.

Harvesting in the case study area occurred on three separate occasions. In 1954 to 1956 the harvest was conducted by Abitibi-Price; in 1971 to '75 and again in 1982 the harvest was conducted by third party operators.

As I stated earlier, the first cut was carried out by workmen manually felling the trees using a buck saw and ax and then bucking the trees into

eight-foot pulp wood size for pulp mill furnish. This was called the cut and pile method. The piles of eight-foot pulp sticks were then carried to roadside by mechanical skidders and the market demand was mainly spruce to be made into newsprint.

Q. Could you just bring the mike a little bit closer to you, please.

A. In more difficult hilly terrain and mixed wood stands, these workmen would manually fell the spruce trees and a horse was used to skid them to roadside where they were then bucked into eight-foot pulp sticks or into saw logs if they were large enough.

Changing market demands enabled us to return to the area for two more harvests. On the return cuts, poplar, jack pine, cedar and spruce that was left in the mixed wood or spruce that has since matured was harvested. On these return cuts, the cut and skid method that was used is the same one that was described in the Canadian Pacific Forest Products case study by Mr. Roll earlier.

As I stated earlier, third party operators harvested the two return cuts. They were given maps showing remaining values and areas that were already regenerated were identified. They were instructed to remove all marketable values so that

further regeneration projects could be carried out more efficiently.

The silvicultural system chosen was clearcutting and will be discussed by Dr. Methven later. The variety of marketable values today makes regeneration easier and more cost efficient because most timber values have been removed in a single harvest leaving the area cleaner for mechanical site preparation and planting.

This case study is an example of how market demands for wood supply direct the harvest activities and why it is necessary for us to have flexibility in plans for harvesting activities. This case study also illustrates that the two return cuts were a result of changing market demands.

Q. Thank you, Mr. Johnston.

Mr. Murray, I believe we turn to you next for an overview of the harvest activities which occurred in your case study found at Tab 4E of Exhibit 1100.

Would you please commence by giving us just a brief explanation of where your case study is, and I believe you will be referring to Exhibit 1105.

MR. MURRAY: A. I will be referring to Exhibit 1105.

As the Board will remember, case study 4E is located in the Great Lakes/St. Lawrence forest region. It is 32 kilometres southwest of -- excuse me, northeast of the town of Huntsville. It is on that little dot if you can see it there. It's located on the Bracebridge Crown management unit. It is typical of the 29 Crown management units in the Great Lakes/St. Lawrence which tolerant hardwood maple is found.

I am going to use some overheads, Madam Chair, just to further describe the location. This is the -- is that clear enough? I guess it will do.

This is the case study area. It is -- the green area, as you will remember, is the case study specifically.

Q. Mr. Murray, is this Figure 8 in your case study?

A. Yes, this is referring to Figure 8 in the case study on page 18 I believe it is. And I also should mention that the -- in the case study 4E the harvest section is found on page 21 to 28.

MR. CASSIDY: Figure 8, Madam Chair, is found on page 19 of the case study, the fold-out.

MR. MURRAY: This overhead is a component that was presented in the case study itself.

The green area, type 418, is the case

study area. It is tolerant hardwood maple working group and the Crown management unit forester selected -- would use the silvicultural selection system because the components of the stand met the criteria for that system.

The stand was marked by the Ministry of Natural Resources prior to the harvesting and the road then was placed -- locations were made and the roads were located.

MR. CASSIDY: Q. These are the roads you have described in the access panel?

MR. MURRAY: A. Yes, these are the roads described in the access panel.

Q. And this road network can also be found on Figure 8 on page 19; is that correct, Mr. Murray?

A. That's correct. This is part of the same picture. These are component portions of that description. The roads were located and the next step -- they were built, as we described in access, and the next step was of course the harvesting operation, the harvesting activity.

MR. CASSIDY: As a result of these being on that figure, Madam Chair I don't propose to have these entered as exhibits, these overheads.

MR. MURRAY: What I have placed now on the overhead is the actual area of the case study and the case study itself which is the green area under the cross hatching.

Having located the roads, the next process -- this is a little bit ahead of it because prior to the cutting the crews are available. In this particular operation there were six crews to -- what are known as pony gangs, these are two-men crews using an articulated rubber tired skidder with a cable and winch.

The six crews were to be located at various spots in the area of the undertaking and this was done by the crew foreman, the cut and skid foreman, who took each crew separately to a location and the -- if you will notice the block dots on the map indicate what is known as landing areas. Each crew would operate basically to a landing.

The foreman would take the crew and walk the area of the proposed block, cut and block, with the crew showing the mid-boundaries of the location, any areas of concern, any problems areas, anything to watch out for and the crews then would proceed to commence harvesting.

The trails in most cases were pre-located

and in many case were perhaps even pre-cleared with the tractor, just a trail made for the skidder to use. The pony gangs, the feller starts -- the cutter or feller as he is called starts manually felling with his chain saw at the back of the stand, back end, and he proceeds to work his way forward.

The skidder in the same sense takes a hitch of trees and forwards them out to the landing. The cutter at the time of felling of the tree -- and I described of course he uses directional felling, et cetera, but at that time he will also identify the location of the log cut to be made on the tree because he has the best opportunity to determine the quality of the product that will develop. He had seen it standing, he had seen it on the ground and he will identify with a small mark by a saw where that tree is to be cut.

The tree is tree-length skidded. The harvesting method was tree-length forwarding. The tree is skidded in tree lengths, usually four or five trees to a hitch depending on the size, to the landing site at which point the skidder operator gets off, drops the hitch to the ground and then proceeds to cut them into appropriate logs. He then turns around and pushes the logs into a small deck. That is one method

that is -- that was the method used on this particular operation.

I think now that's it for now, I will return and proceed to describe the alternatives.

Q. Before you do that, Mr. Murray, I just want to be clear. The red cross hatches, what did they represent on Figure 8 in this overhead?

A. The red cross hatch refers to the actual area cut in the operation of G.W. Martin in this particular location for that operating period.

Q. And where that overlaps with the green area on Figure 8 and on this overhead, that is the case study area that was harvested; is that correct?

A. That's correct. That is the actual case study period, the green area under the cross hatch. I forgot to mention, this operation took place in the -- basically in August of 1986.

The reason that you see roads extended beyond the cutting area, the harvesting area is that they will be returned to -- the crews were moved from this point to an area inside Algonquin Park actually where cutting is not permitted during the summer months of July and August, but they do recommence in the fall and because of that these areas which are outside the

park are retained to use during that period of and retained within the park area to give a balance.

Q. Thank you.

MR. CASSIDY: Is it the Board's intention to break at 10:10?

MADAM CHAIR: Yes, it is, Mr. Cassidy.

MR. CASSIDY: Q. Go ahead, Mr. Murray.

MR. MURRAY: A. There were options available to the G.W. Martin organization with regard to the harvesting method. In the Great Lakes/St. Lawrence area, the three methods used were shortwood, tree-length and full tree.

Generally, though, it is either shortwood or log length as it is generally called there and the tree length. The shortwood -- or the log length method is generally used by the smaller operators who, because of constraints of equipment size and/or the size of their operation and the fact that it is not a full-time vocation, will often then use the smaller equipment.

The case study area -- in the area of the case study the use of a horse or small tractors is not practical, although those are our options in the area. The use of grapple skidders, which are the larger units that the Board has seen demonstrated in illustrations, are impractical in the use in the selection system

because of their inability to pick up selective trees and the random trees, use of high flotation hires is not practical because of the problem of potential impact on the residual stand. Many young regenerating trees just don't need that large area and you just don't need the bearing capacity.

The equipment depends on the harvesting method and in the case of study as it was, the tree-length system was being used, therefore, articulated rubber tire skidders were the chosen option.

I've described briefly in the overhead the procedure used, the way the foreman took the crews to the back and worked with them. During the harvesting, during the cutting there is a continual supervision on these men, on the crews, pony gangs by both the company foreman who is checking out the fact whether our trees are being left, whether there is damage being done, et cetera.

The Ministry of Natural Resources is also on the site regularly to check with regard to compliance with the regulations that may have been attached to the planting permit, cutting boundaries, et cetera.

The completion of the forwarding to

the -- off road forwarding to the landing and the log being pushed up, they are hauled by truck to the site of the mill using somewhat smaller vehicles. These are licensed vehicles. They are large but they are generally self-loading type of vehicles which the Board may have seen. They have a hydraulic loader mount on the back of the truck, they load the truck and the trailer. Because of the trailer they are a little more capable of handling the -- navigating the lower geometric standards that often used on the roads.

There is a broad range of species produced in the Great Lakes/St. Lawrence and even on the case study there were a number of species: birch, maple, hemlock, spruce, beech, a few scattered hardwood known as other hardwood, such as cherry.

The log quality varies from the veneer quality log which will be cut into veneer - and I can illustrate later how that is done in a photograph - down to the lower grade log, as I've mentioned in the case study, the firewood component, the cleaning of the stands.

They all have a very -- there is a broad range of values and just for comparative purposes I would like to mention to the Board the price per log and I am using this to describe the value of an average

sized log. A veneer log could run between 50- to $60 per log, it is valued at the mill site; a quality sawlog, that's a No. 1 grade sawlog, that runs between 12- and $15 per log. A low grade sawlog could run between 8- and $10 and the firewood type log would be as low as 2- to $4 a log.

On the average harvest, the range of quality of logs can vary of course, but it would be something like about 3 per cent of the logs produced would be the veneer quality log. The quality sawlog would range in around 40 per cent. Low grade sawlogs would be about 27 per cent and the pulpwood type -- excuse me, firewood, pulpwood type log, and they would be about 30 per cent in the total reduction.

The logs from the G.W. Martin operation are winched to the Huntsville sawmill and the veneer quality logs are shipped to their veneer mill in Rutherglen which is near North Bay. The by-products of the sawmill such as chips and sawdust were sold to pulp mills and fire board plant.

The lumber produced at the sawmill is primarily maple and it again ranges in quality depending on the quality of the log. However, about 30 to 40 per cent of the product of the log, of the maple log is a grade which is a lower grade and it was

shipped to G.W. Martin -- after cutting and kiln drying it was sent to the G.W. Martin strip hardwood flooring plan in Huntsville. That plant uses a great deal of this low grade material, not only from the Martin mills but also from other suppliers such as McCrae.

Q. Did you say McCrae?

A. J.S.L. McCrae. The Board I believe visited the J.S.L. McCrae mill, a sawmill very similar to the type of our plant.

Finally, I'd like to make just a few comments on the variations that are found in the Great Lakes/St. Lawrence area, variations that would be from the case study.

There are occasions where tree-length harvesting is carried out on hardwood. J.S.L. McCrae was an example of that. All logs are taken out in tree-length to the mill site where they are slashed into the various products and low or high grade logs go into to the two mills or into chips. G.W. Martin also uses tree-length in some of its operation but not in the case study area.

On the landings, in some cases rather than manual bucking of logs there are occasions when slashers are used, a one-man or two-man slasher can be used.

As to the matter of harvesting systems -- excuse me, silvicultural systems, there are occasions on the Great Lakes where patch and clearcutting of the tolerant hardwood that does not meet the criteria selection is carried out. I believe, again, the Board visited with Mr. Hynard in Minden and they had some examples of that.

And finally in the Great Lakes/St. Lawrence the pine working group, red and white pine, primarily white pine, is a fairly significant portion of the Great Lakes and, of course, it uses a system of shelterwood management. And the Board again visited, I believe on that same tour, some shelterwood management in Algonquin Park area, the Algonquin Forestry Authority,, they use both the uniform shelterwood and the seed tree system as well.

And finally, because of its nature, the Great Lakes area does have components of the boreal forest species such as poplar, white birch and in small wet locations black spruce and white spruce in those locations. The prescriptions as applied in the ground rules in the boreal region applied as well in the Great Lakes area harvest at that time.

In conclusion I would just like to run a few slides through for the Board.

MR. CASSIDY: These slides again may be found in Exhibit 1101.

Q. Would you please make sure you identify each slide number, Mr. Murray?

MR. MURRAY: A. Yes. This is slide -- these are all referenced on page 27 of the case study. This is slide 6.3 and it is merely a depiction of a crew foreman and a -- I should add that again these were not on the case study, these are representative of it. This picture was taken by the Algonquin Forestry Authority and one of their supervisors is talking to one of their contractors who in turn, they are discussing some problems -- or they're discussing with a cutter.

This is slide 6.1. This is merely a depiction of a cutter felling a large hardwood tree. The same problems -- or problem with safety, care must be taken as Mr. Roll mentioned in his and it must be even more so in many cases because of the nature of the heavy hardwood tree and the erratic -- in some cases, erratic way that they may fall.

This is slide 6.2. It's a typical skidder used in the Great Lakes/St. Lawrence Forest region and in other parts of the undertaking. He's skidding out some hardwood logs - one, two, three,

four, five, six. He's approaching the skidtrail at an angle and it will be his requirement to ensure that he doesn't damage the residual trees and the young regeneration.

This is slide 6.4. This is the slide I referred the Board to previously as a photograph. It's depicting a winter operation, again from the Algonquin Forestry Authority in which you can see the skidtrails fanning out from the central area and the attempt to ensure that they follow a pattern that will have minimum impact on the area.

This is slide 6.6. This is a landing crew. This was not the type of bucking that was -- as they term, bucking the logs that was used in the case study. In this particular instance the logs were brought out to a particular landing and a man with a chain saw and another man who was charged with the responsibility of getting the maximum quality from that log. The logs would then be picked up by a front-end loader and put in pile or loaded directly on the truck.

In this particular slide, this is again slide No. 6.7, and this is provided by the Algonquin Forestry Authority where they were actually decking logs with a front-end loader in preparation for shipping. These are quality sawlogs and they would

have a number of different skid piles based on the quality of the log, whether it was a sawlog, veneer log, firewood log, pulpwood or what.

This is slide 6.8, and these logs bring joy to the heart of any hardwood forester. These are large yellow birch and maple veneer quality logs. These are the very high quality, high-priced logs that I mentioned previously. These logs as I mentioned too would be transported to the G.W. Martin veneer mill. And if the Board hasn't had the opportunity to see a veneer mill operating, it's something that is worthwhile.

The logs are cut to approximately 8-foot length. They are placed into a large lathe on what is known as chucks. These are steel circles that imbed themselves in the end of the log. The log is then rotated against a sharp knife and that is how the veneer is peeled off. It comes off at approximately a 28th or a 30th of an inch in thickness, is dried in dryers, it then is clipped into the various widths based on its quality and they are sorted into the various grades.

The end product will end up in a number of places. I don't see any in this particular room, but most hospital doors are made of yellow birch veneer

and it end up in panelling, furniture, a varied number of...

Finally, this is a slide of the harvest -- or the loading aspect and the trucking. This is kind of a front-on view - this is slide 6.9, excuse me - and this self-loading truck is taking logs from the deck and placing them on the truck and they will be taken to the mill site, wherever in this particular case that would be.

That concludes my slides and presentation.

MR. CASSIDY: Madam Chair, it's 10:10 and I suppose we could have the morning break.

MADAM CHAIR: Yes, Mr. Cassidy.

---Recess taken at 10:10 a.m.

---On resuming at 10:35 a.m.

MADAM CHAIR: Please be seated. Mr. Cassidy, I caught a few of your remarks at the end of the break--

MR. CASSIDY: Oh-oh. What did I say?

MADAM CHAIR: --about cross-examination tomorrow and possibly finishing Panel 5.

MR. CASSIDY: Panel 6.

MADAM CHAIR: Panel 6. We don't know what time Mr. Hanna is going to show up tomorrow. I

was assuming it was first thing in the morning, Ms. Devaul is not sure. So I think that the Ministry of Natural Resources and the Ministry of the Environment should be prepared to go on tomorrow morning in the event he isn't here.

MS. SWENARCHUK: Dr. Quinney told me yesterday when I spoke to him that they would be flying up tonight, so I assume they'll be here.

MADAM CHAIR: Oh well, then that will be fine. All right, good. Thank you.

MR. CASSIDY: Great.

Q. Mr. MacKay, could you complete this segment of the evidence by providing the Board with an overview of the harvest activities in the case study you represent, the case study found at Tab 4B?

MR. MacKAY: A. Yes, that's right.

Q. And I understand you wish to refer to Exhibit 1105 to illustrate where the case study is once again for the Board?

A. Yes, that's correct. Okay. On Exhibit 1105 we see here the E.B. Eddy FMAs, Sudbury about in this location, and it's about 80 miles northwest of Sudbury the actual case study area.

I would also like to refer to a couple of more exhibits to show this in a little bit more detail.

This is Exhibit 1112 presented by Mr. Waddell in the case study overview and it just shows the three E.B. Eddy FMAs in a little bit more detail. Here's the case study area, Sudbury here, and our Espanola pulp mill here and the Nairn Centre lumber mill is here.

And there is one more that even shows this in a little bit more detail. Okay. This shows the actual case study area, this consists of four blocks --

Q. This is Exhibit 1113?

A. Yes, I am sorry 1113. Consists of four blocks A, B, C and D. Blocks A and B as mentioned by Mr. Waddell had the aspen overstorey removed and blocks C and D had the aspen overstorey maintenance, and I will discuss that a bit further.

The harvest in the four case study blocks was carried out in 1980 and in all four blocks the method of harvesting was conventional cut limb, top and skid. The system we used is almost -- or very similar to what Mr. Roll has explained this morning with his slides of the cut-and-skid operation.

At the time of the harvest we had three options to choose from in our harvesting system; that was the mechanical, semi-mechanical and a conventional system. We chose the conventional cut-and-skid because

of the areas that we were operating in, and if I could have the one slide I could slow this in a bit more detail.

Q. Just while we are waiting for that, what silvicultural system was used?

A. We used the -- in all four blocks used the silvicultural system of clearcutting, and as Dr. Methven will explain, this is appropriate system for the jack pine species.

This slide is not the case study area, it's slide 2.3 from Exhibit 1101, case study 4B. As I said, it's not the actual case study area, but it's very representative of the kind of stand composition and terrain in the areas.

Q. Would you just give us a brief description of the terrain as depicted by this photograph?

A. Yes. As you can see the stand composition is a high component of aspen mixed in with mature jack pine and, although you cannot see it very well in this slide, there is various areas of bedrock outcrops and some surface boulders which came into play when we decided which system to use there, being the conventional.

These stand compositions and terrain

would limit the manoeurability and applicability for a mechanical system. I should add though that with our present day harvesting systems we would not hesitate to operate in this area with the mechanical system with the developments that have taken place in the last 10 years.

As I mentioned yesterday, we did not harvest the poplar, the aspen in this area. There was no market for the poplar and today that remains the same. In 1980 our Espanola pulp mill was using in the order of 25,000 cunits of poplar a year. This was easily furnished by local suppliers in the area. Since 1980 our Espanola pulp mill has expanded and we are now using in the order of 100- to 110,000 cunits of poplar at our Espanola mill site, but the situation is unchanged in that this can still be supplied by the local suppliers in the Espanola area.

I should mention that third parties have come on to our FMAs to harvest poplar, but not in a pulpwood form. They have come on to cut veneer -- I am sorry, to cut poplar for veneer and specialty products such as waferboard, but this overall is a small volume of the total cut in our area and, as I say, it has not been for pulpwood.

We believe that there may be a market

developed for the aspen in our area and because of this we have carried out two experiments in the last year and a half where we have cut I think about 2,000 -- yes, 2,000 cunits of poplar as an experiment using our mechanical system. We did this to determine suitability of the mechanical equipment in harvesting poplar, first of all because the silvics of it are such that poplar is much heavier per unit volume than jack pine, and also as we see the niche for this market or a need for this market or a market arising in the future, we want to start preparing ourselves for that potential market. That is about it.

Q. All right, thank you. Could we have the lights back on.

MR. CASSIDY: All right. I would now like to turn Madam Chair --

MR. MacKAY: Excuse me, Mr. Cassidy.

MR. CASSIDY: I am sorry.

MR. MacKAY: I would just like to mention, there is more detail about the aspen on pages 18 of Exhibit 1100 in case study 4B, the bottom of page 18 and three quarters of the following page, 19.

MR. CASSIDY: Thank you. Madam Chair, I would now like to turn to Dr. Methven in respect of Section 8 of the witness statement commencing on page

42, and just have your indulgence.

Q. And, Dr. Methven, perhaps you could summarize this section for the benefit of the Board?

DR. METHVEN: A. Thank you, Mr. Cassidy.

Madam Chair, Mr. Martel, I would like to open first of all with a quote from Dr. Holling which can be found on page 46 of the Exhibit 1121, the statement of evidence. The quote is:

> "For impact assessment as a review process, the intensity of disturbance by man cannot be assessed simply by its absolute magnitude, it must at the least be measured in terms of degree of variability that has been historically experienced."

I think, therefore, it might be useful if we take a very short trip into the past to see where we came from or at least where the forest came from. And so I might ask if we could cast our imaginations back around 400-million years or so, back to Silurian when land plants first evolved.

At that time the oceans and the seas of course were teeming with life, but the land was totally devoid, nothing but rock, rubble, sand and soil, very active volcanos, earthquakes, storms, droughts, what

have you, very hostile environment in other words, yet in spite of this biological organisms - being what they are, always looking for an empty space - some species did manage to work their way up out of the oceans through the entidal zone and up onto the land. A remarkable fete when you think about it.

Now, by Carboniferous, a hundred, two hundred million years or so later, the land was dominated by forests. These forests of course are now the source of our coal, oil and gas that keeps our civilization going at the moment.

This period was then followed by another period, the Permian, with great droughts, glaciations, very hostile environments which caused these forests of course to re-adapt and evolve other mechanisms to survive, and they did so of course.

And in the Triassic we found another era of large vast forests covering the landscape, went through all kinds of other problems with the environment, through the Miocene and Pliocene until we came through our glaciations, and our current period, of course, in the Pleistocene where we've had four of them, and the most recent only left this landscape about 9- or 10,000 years ago.

Associated of course with this large

climatic and disturbances of course is fire, one of the major portions of the landscape. This was the penalty that plants paid of course for dominating the landscape as they created organic matter that would then allow lightning ignitions and fire to occur. So they did succeed in moving on to land but they did pay a price.

However, in Ontario as you know fire is a very dominant part of the landscape. The plants and other species have fully adapted to it and have evolved to survive in the face of this environmental disturbance and the net result is they are highly resilient and able to withstand all kinds of disturbances.

Now, in Ontario at the moment the forest -- at least not the moment, but in the past, until we started fire suppression the fire cycle was approximately a hundred year fire cycle or 50 to 100-year fire cycle, which meant that approximately 1 to 2 per cent of the land was being burned over every year on average.

The Ontario Ministry of Natural Resources has a very efficient and effective fire management organization, the Aviation Fire Management, and they have managed to reduce this.

MR. CASSIDY: Just a second.

MS. SWENARCHUK: I am having great difficulty taking notes with the speed.

DR. METHVEN: Sorry.

MR. CASSIDY: Could you slow down a bit, Dr. Methven, if you would.

DR. METHVEN: Just to recap. The national fire cycle in the boreal forest of Ontario as I said is 50 to a hundred years. Due to the efforts of the Ontario Ministry this has now been reduced to approximately .14 per cent per year on average, which approximates a fire cycle of 700 to 800 years. So a major reduction in fire on the landscape.

I would like to say a word about fire size. Fire of course occurs in all size classes from less than a hectare to in the region of hundreds of thousands of hectares as you have heard previously. In Ontario since 1978 over 98 per cent of the area burned has been burned by fires over 200 hectares in extent. This is a little misleading because 200 hectares was the maximum size class that was used in those statistics. As of 1987 the class sizes were changed, so from five classes we went to eight classes and the top class is now over a hundred thousand hectares rather than 200 hectares.

Now, the Ontario statistics I have been

able to obtain have been for 1987; '88 and '89 have not been worked up on that basis, and for 1987 over 80 per cent of the area burned was by fires that exceeded 1,000 hectares. So we have a situation of relatively large fires burning over the landscape, creating large openings.

MADAM CHAIR: Dr. Methven, was that 8 or 80 per cent?

DR. METHVEN: 80 per cent, yes. To be more precise, I could say that 48 per cent of them were 1,000 to 10,000 hectares, 36 per cent was 10,000 to 100,000 hectares in size.

The other disturbance besides fire of course is wind. In Ontario wind is causing disturbance of about 0.02 per cent, which of course is much less than fire but still can be very significant, and as the question of insects, large insects epidemics also, however these will be covered in Panel 7 and I won't say any more on that subject at this time.

I would now like to say a few words then about disturbance pattern; i.e., the pattern on the landscape caused by disturbance like fire.

Each disturbance of course is unique in terms of its size and its configuration and this is largely a function of intensity of the event. The net

result of these disturbances is that the landscape is covered by stands; i.e., the forest is composed of stands of even-aged structure, therefore, if we want to look at the overall pattern of the landscape we will see that it is composed of an induced pattern caused by these disturbances superimposed on what we might call an inherent pattern caused by site quality and its relationship to vegetation. So we have got a disturbance pattern of age classes superimposed on the species pattern caused by site.

MR. CASSIDY: Q. What landscape are you referring to Dr. Methven?

DR. METHVEN: A. I am referring to all, but also Ontario. Many landscapes throughout the world of course have the same features.

The scale of this pattern is quite large because the site features on our landscape that have originated from the glaciations that have taken place here are often quite large in terms of old lake bottoms and glacial outwash planes, so the basic inherent scale of site is often quite large and, as I have already noted, the induced scale of disturbances can also be very large. So what we have is a very coarse pattern on the landscape in many cases.

It's interesting to speculate or to look

at the implications maybe of what our current constrained harvesting size of 130 hectares is doing to this natural scale of landscape.

Right now I would like to say a few words about adaptations to disturbance to get down to more specifics here and try and look at some individual species. I would also like to stop using the word disturbance because in fact many of our species have so adapted to these disturbances that in fact they have become necessary for the continued survival and evolution of these species, and I would rather call them renewal agents rather than disturbances. So that is where I will be going from this point on.

I think this fact is practically illustrated. I am currently involved in designing management plans to burn our national parks, including Pukaskwa and this, of course, is a product of the realization that to conserve the systems in our parks we need to disturb them and we need to burn them, unless we want to use the product for another purpose such as timber.

I will run through five species quite briefly to illustrate why these can be regarded as renewal agents. I will start with jack pine, a very important species in our landscape for many reasons.

This, of course, is the classical fire-adapted species. It requires fire for three primary reasons. The main reason is to kill the existing stands and open up the forest floor to provide full light, nutrients and water for the next regenerating stand; it is required of course to open the cones which are serotinous in order to release seed; and it was required to consume the organic matter on the forest floor to provide that seed with the moisture stable seedbed, one that is in fact close to the mineral soil.

Without fire, we would expect jack pine -- its renewal requirements would not be met and jack pine would tend to disappear from the landscape in terms of the large closed even-aged stands that we are familiar with.

I will now look at black spruce. This is another pioneer species on the landscape and most of the stands we find out there are of fire origin. What fire does here is, once again, open up the canopy, destroy the existing stand; in other words, these also have partially serotinous cones so it helps to release much more seed. There is also a requirement for a mineral soil moisture stable seedbed on park lands and fire accomplishes this and, therefore, ensures

regeneration renewal of black spruce on the landscape on upland areas where there is no advanced layering of black spruce in the understorey.

Once again, in the absence of fire, we could expect a tremendous reduction in the presence of black spruce in our upland areas unless we do something analogous to fire in order to create these disturbance conditions and renew the species.

Trembling aspen is an important hardwood, however becoming more important all the time. This species has the advantage of having two regeneration mechanism, one by seed and one vegetatively. Both mechanisms require disturbance.

The seed is extremely small, wind disseminated, it moves large distances by the wind and after it settles on the ground its life span is very short and it requires, once again, a good moisture stable seedbed close to mineral soil that is created by disturbances such as fire or renewal agents such as fire.

In terms of its vegetative reproduction, it produces roots from the sprouts -- sorry, sprouts from the roots. This requires removal of the forest canopy, heating of the forest floor and stimulation of these buds to produce new shoots. So, once again, we

need to remove them out of the forest and prepare the ground.

I will talk briefly about red and white pine as two important species, for example, in the Great Lakes/St. Lawrence Forest. These species of course are not silvically identical but their adaptation to fire is very similar; namely, they develop in the more mature stages a very thick, corky bark that resists fires and allows some individual within the stands to survive fire and serve as a seed source.

So the role of fire with these particular species has been to thin out the stand, providing more crown space, better crown growth and more seed production from those trees that survive the fire because of their bark, it consumes the forest floor once again, thereby improving the quality of the seedbed with the establishment of the pine seedlings and also provides more nutrients at the same time in a readily available form.

By opening up the stand it provides more light, water, nutrients for the growth of those seedlings. It controls the development of major understorey competitors especially on till sites where competition can be quite fierce in terms of species

such as red maple, hazel, balsam fir, spruce. And finally, what fire accomplishes is it controls two major insects of the red and white pines, the red pine cone beetle and the white pine beetle which is are major common seed predators of red and white pine. So even though we may have ideal conditions for regeneration, if the insects aren't controlled the seed supply will be minimal.

We have a problem in Ontario right now, and of course we have been practising fire suppression for many years, therefore, we will be excluding fire from these pine stands, in many cases on the better moisture till sites, the understorey developed considerably underneath the pines, spruce and fir developed a major fuel problem so that if a fire does run through these stands now they are going to kill the pines.

They have also been invaded by the spruce budworm, the furtherest developed with the pines and it has also caused another major fuel problem, so it is going to be extremely difficult to manage many of these pine stands naturally now because of fire exclusion that we have been practising for the last 50 or 60 years.

I won't say anything now about harvesting

systems, I think they have been well presented in this panel to this point.

I will then move on quickly to silvicultural systems in more detail than I did before and, as I mentioned at the beginning of the presentations, we are dealing with four reproduction methods that give their name to the four silvicultural system. We will start off with clearcut.

The clearcut reproduction method basically involves making large openings in the forest by removing all the trees in one cut. What this does is maximize the availability of light, water and nutrients on the forest floor that are needed to satisfy the regeneration and growth requirements of intolerant species such as jack pine, aspen, birch and to maximize the growth of intermediate intolerant species that have either been established as advanced regeneration or they're arising from sprouts on the stumps and these can be black spruce, can be red maple, can be sugar maple, it can be beech, whatever.

The ecological foundation of course for this reproduction method is the one I have been talking about up until now, is it the large openings created by such removal agents as fire and windstorms and insect epidemics and the clearcut system is in fact suitable

for the whole range of species that we deal with, whether they are considered intolerant, intermediate or tolerant.

Q. And that would include the species discussed in the case studies?

A. It would.

Q. Okay.

A. I will talk briefly about the seed tree cut. This is essentially a modification of clearcut except a certain number of seed trees are left within the clearcut to provide seed, to provide a natural seed source for regeneration. It of course requires species that are relatively firmly rooted so they don't blow down when they're exposed such as the pines, for example.

A word or two about shelterwood cut. It is a reproduction method, it evolves from moving trees in two or more cuts and creating a large number of relatively small openings, either openings created by the removal of a single tree or a very small group of trees. And what this does is promote seed production by the remaining trees and provides shelter for those intermediate or tolerant tree species that are required and once of course the seedlings are established, the final cut, which is essentially a clearcut, is made to

release and maximize the growth of those seedlings. The net result, as it is with clearcutting, is an even-aged stand structure. This of course is suitable for intermediate and tolerant species.

Selection cut is the final one. This, once again, involves removing trees individually or in small groups to favour the regeneration of tolerant or intermediate species. Unlike the other three that I've mentioned, each entry into the stand involves harvesting, it involves thinning, it involves cleaning, it involves regeneration and the stand tends to be entered at five to ten year intervals. The net result of this is uneven-aged structure in which the size, age class, also what we call a negative exponential distribution or a negative J curve. The ecological foundation of this method of course is simple, it is in essence mortality with individual trees within stands of tolerant species.

Social reproduction methods that I've covered within the silvicultural systems of course are the tending procedures such as pre-commercial thinning, improvement cutting, commercial thinning and what have you. What these do are control the species composition after establishment and control the rate of growth within the trees within the stand and allows one to

manage for different products.

Q. Dr. Methven, is clearcutting -- I'm sorry, the clearcut silvicultural system an exact duplication of the natural disturbances you have described?

A. No, the clearcutting is not an exact duplication. There are small differences, whether it is to do with micro-climate, whether it is to do with nutrient dynamics, whether it is to do with the scale of pattern of the landscape.

MS. SWENARCHUK: Sorry, I am still having difficulties, Mr. Cassidy.

MR. CASSIDY: slow down.

DR. METHVEN: My apologies.

Yes, clearcutting is different from natural disturbances, as I said, in terms of one micro-climate to some degree, to nutrient dynamics; three, the scale of disturbance on the landscape. I could talk about these in more detail if that ws necessary?

MR. CASSIDY: Q. Does it approximate natural disturbances?

DR. METHVEN: A. Yes, it certainly does approximate the natural disturbance and in a fire exclusion mode that we are in it's the closest

approximation that we can come to.

Q. Is it an appropriate method for regenerating the boreal forest in Ontario?

A. It's a very appropriate method and it's the only method that will in fact do that in the absence of fire.

Q. Before we move to the graphs, I think you have a few concluding comments that you want to add?

A. Yes. I would just like to conclude summarizing. The renewal agents of the forest of Ontario have been fire, wind and insects, with fire undoubtedly being the most dominant. A very high proportion of the area that has been disturbed has been disturbed by large scale events in terms of fire in excess of 1,000 hectares, so that the pattern on the landscape is relatively coarse.

The suppression of fire, of course, amounts to a removal of the necessary renewal agent and could, if it wasn't replaced with something else, cause a significant loss of species or a dramatic change in the proportions of species on the landscape.

The clearcut silvicultural system and its application as a tool of harvesting is the most appropriate means available for replacement of that

renewal agent in maintaining, conserving our forests.

Q. All right. I would like to now move to a portion of your evidence dealing with the graphs that were generated, particularly those from page 65 on in this section. I understand you wish to demonstrate how these graphs work in response to a request both by me and the Board at the scoping session, to demonstrate how these graphs were generated and I understand that you wish to do this by way of using a computer model.

Perhaps you can outline first what the purpose of this evidence is and the purpose of the model?

A. Computers and computer models have become a major tool in the kitbag of foresters these days and the Board has heard several references to computers and simulation models and I thought this might be a good opportunity to in fact show some simple examples of such models that have been developed by foresters and are being applied in Ontario and in other areas.

The purpose of these models is to explore the dynamics of the system; i.e., to play scenarios with different harvesting levels, different harvesting rules and see how the forest might react and to learn. Simulation models like this are at the core, for

example, of adaptive environmental assessment in management process and everybody is moving in that direction now.

Q. I understand it's not your intention to go through every one of these models because they deal with different variables that one could input into the model?

A. No, I would merely like to demonstrate the kind of things that are done to produce these.

Q. All right.

A. Thirdly, they allow one to see visually the dynamics of the forest. We all have a terrible tendency to see the forest out there and because it is running on a different time scale than we are, not to observe how dynamic and moving it is, so this helps to illustrate that point.

I would like to emphasize right now that this example that I will be running through briefly is in fact what we would call a strategic model not an operational or management model and it will merely deal with changes over time not space.

Of course when we get to operational management, space becomes crucial in terms of blocking out harvest blocks, in terms of access, in terms of

scheduling. So what one does is takes the simulation models like these, links them what what we call geographic information systems and then we have a complete package.

Another feature of these models that we consider very important is they are what we call transparent. What we mean by that is there are no fancy equations in there, there is no complicated procedures, they are built so that we can sit down with foresters or with anybody else and in a very short time have everybody exploring these scenarios an seeing what the results are.

In order to try and achieve some of this transparency here, I would like to spend two to three minutes with a flip chart before I go to the computer, if that's possible, to explain what drives the computer.

MR. CASSIDY: If you could bring that flip chart forward, Mr. MacKay, so that the Board can see.

Q. I understand this will explain what they will see on the computer model?

DR. METHVEN: A. That's correct. I have drawn a very crude picture here. You will have to forgive my artistry it is one talent I certainly do not

have.

Essentially these kinds of simulation models are driven by just two components: an age-class distribution and a yield curve. Of course in the forest out there we have many age-class distributions for many working group or cover types and also many yield curves and all this is is the area that exists on a particular management unit by age class, so this is a proportional or area scale and this is the amount on that landscape of each age class, in this case I put in 0 to 100.

Underneath that, we have the yield curve which merely demonstrates, in terms of cubic metres per hectare, how a particular stand or group of stands or a working group changes over time. In this case it becomes merchantable at 30 years and we see merchantable volume in cubic metres per hectare increasing over time, reaching a peak and then as the stand dies and trees starts to drop out, of course, the merchantable volume declines.

Now, the age-class distribution over time keeps shifting to the right, okay, so ten years from now all this will shift to the right.

Q. Will you be able to demonstrate that on the computer model as it runs?

A. Yes. The net result of this shift of the age-class distribution with time as stands get older is that the relationship of this to this changes. (indicating) Right now we see what this yield curve shows at 60 years maximum volume, but 60 years we have this much area in that volume and that's a reasonable amount. However, when this shifts in the next 20 years from left to right--

Q. You are talking about the age-class distribution?

A. --the age-class distribution shifts, you will see that this part of the age-class distribution will be following on this area of the curve and, therefore, the growing stock in that forest will decline quite dramatically.

So basically all this computer does is just bookkeeps these changes over time with the age class and the yield curve.

With fire, of course, fire can hit anywhere along this system and when it does it returns it to zero. So when fire hits this age class it becomes an zero age class, when it hits this one it becomes this. (indicating)

Q. All right. Describe that for the record. When it hits 70...

A. Well, if it hits any age class, whether it's 20, 40, 60, 80, 100, 200 it will return that portion of the age class that has burned back to zero.

Harvesting, on the other hand, does something somewhat different. Harvesting does not occur anywhere on the distribution because we don't harvest 20 year old stands or 30 or 40 year old usually. We try and harvest somewhere around here. (indicating) So we tend to harvest --

Q. Somewhere around where?

A. Somewhere around the peak, the yield. And we will see this on the computer simulation, what this does.

MR. CASSIDY: All right. Perhaps before you start the computer, we should enter that drawing as the next exhibit, Madam Chair, and we can describe that as a hand-drawn diagram of the age-class distribution and yield curve?

DR. METHVEN: That is correct.

MR. CASSIDY: This will be exhibit...?

THE CHAIRMAN: Exhibit 1123.

MR. CASSIDY: Thank you.

---EXHIBIT NO. 1123: Hand-drawn diagram of the age-class distribution and yield curve.

MR. CASSIDY: It might be appropriate to have the lights out now, please.

DR. METHVEN: I should also add that these models of course were designed to run on a colour monitor so we have a little problem here in terms of its clearness in this situation.

MR. CASSIDY: Q. I understand that in the course of this demonstration you wish to demonstrate this model by way of various scenarios that you will now describe?

DR. METHVEN: A. That is correct. In order to save time, I basically put in some very simple models here, prepared them in terms of the age-class distribution, in terms of the yield curves that I just discussed. In terms of a harvesting rule, the harvesting rule that I have inserted here is the one that harvest those stands that are losing volume the fastest and our other alternative is to harvest those stands that are oldest and we can play different harvesting rules and I will just play one rule here.

You enter the area and enter the harvest that you want to take, wildfire or nothing.

The three models I have set up here that I am going to run through -- well, I have several but I will just run

through the first three. The first one involves a simple spruce forest where fire has been totally excluded and where there is no harvesting.

What we have said in this particular scenario is that 50 per cent of the spruce will fail to regenerate when it gets old because there has been no disturbance or no renewal agent to create the necessary conditions. 50 per cent of it will regenerate on the basis that it has understorey layers available that can replace the mature trees when they die.

Depending where you are in Ontario, these percentages would shift dramatically. On the Clay Belt and lowlands you could up the layer and, therefore, the percentage success much higher, on the upland areas you would have to reduce it.

What we see here again is the age-class distribution up here and this has just been drawn in and then one can enter those age-class distributions any way one wants just by drawing curves, either with a pencil or whatever, and here is the growing stock which is simply the amount of merchantable volume in the forest in cubic metres per hectare -- I mean cubic metres not per hectare or cubic metres over time.

You will see on the right there it says zero years, so this is where we are right now and I am

just dealing with natural spruce and NSR which is not satisfactorily regenerated in our forestry terms.

Q. Could you explain the axes?

A. I'm sorry, yes. This axis here is just a relative axis of area. The computer will take these relative proportions described by the curve and fit them to the actual area that is being entered into the model and of course the "x" axis is strictly strictly time or years.

Q. You might want to speak just a little bit a way from the mike, Dr. Methven.

A. Okay. I will just start moving this through time. We can start to see -- or I will let it run faster. You can see --

Q. In the right-hand corner there is a figure moving, what does that represent?

A. We now can see -- the computer moves awful fast in time. We are already at 120 years in those few seconds. We can see that the age-class distribution shifted dramatically to the right and what is coming in here is 50 per cent of that regenerated by layers and 50 per cent did not regenerate at all.

The growing stock is fresh and quite heavily because of the age-class distribution shift. The yield curve would probably peak around here and,

therefore, there is very little area where the yield curve peaks in volume and, therefore, the growing stock of the forest crashed. We can see that on the axis, we can just keeping dragging it on.

Q. Now, you started the program again?

A. We are now at 255 years already. We can see now the volume has picked up slightly because what we have is a major part of the area here is over the peak year, part of the yield curve that has been entered which is a little different from what you see on the flip chart which is at 60, so we can just play this. You can see the NSR coming out at the bottom here.

Q. That's in the growing stock?

A. Yes, that's in the growing stock. So that gives us some idea of the kind of thing that will happen if we have no disturbance on the landscape, but based on 50 per of the black spruce heavy understorey layers that may or may not be true. Of course we can change that in any way we'd like.

The growing stock of course, as you see, is much lower than we started with, in the situation we started with is roughly about the current situation on the landscape.

Q. Now it's 655 years on that model; is

that correct?

A. That's correct. I will now move onto the next one.

Q. The next model?

A. The next model. And basically what we will do in this case is apply some fire to the system and see how that might react.

We will start with the same age-class distribution as we had before to keep the thing constant, and so this time rather having no disturbance at all I have entered in this case a hundred year fire cycle which is what we had in Ontario roughly before we started applying fire suppression. This means that on average we burn 1 per cent of the area per year.

I will just stop it there at 80 years. What we see happening here now is, when fire burns it burns anywhere across this whole age-class distribution and whenever it burns it sends everything back to zero. Now, if something goes beyond 250 years without burning, we have said that it will not regenerate satisfactorily, and so then we will have NSR. That of course is a judgment call; different players might play -- enter a different number.

We can see the classic negative exponential age-class distribution that is caused by

fire starting to develop up here, and if we let the thing run longer --

Q. You are referring to the age-class distribution?

A. I am referring to the age-class distribution, that is correct. And at the same time I think we can get a very good idea of the dynamics of the forest and even though the computer is running terribly fast over 150 years this in fact is what the forest is doing and, as foresters of course, you have to keep grabbing this moving target all the time and trying to understand it and interact with it positively.

I will just carry it through. So we are 265 years in the future and we can see this classic negative exponential distribution associated with fire which is very different than the distribution you had without fire. And this is roughly the scene in terms of age-class distributions before we arrived here and started applying fire suppression to the system.

If we look at the growing stock underneath we can see it started off by crashing, rise slightly and has now stabilized and if that fire cycle is maintained the growing stock will stay at a constant level.

So we will go to the last one that I will deal with here which is the Model 2. This is model -- the third model that I will show and in this one we will look at harvesting as opposed to fire and as opposed to nothing.

So what we will do here is harvest this forest with this yield curve, this spruce forest. There will be some fire. The fire that is entered here is about an 800-year fire cycle which in fact is the current situation in Ontario and, therefore, we do have a little fire in here but it has relatively small effect and most of the impact will be the harvesting impact. As soon as we start harvesting of course we have got a slightly more complicated picture.

We still have the original two graphs here. The age-class distribution and the total growing stock is what we have been looking at up until this point. Over here - I am afraid it's not very clear because of the light situation - is in fact the yield curve that is driving the thing that you can see on the flip chart a slightly different one.

The square involves the area and the yield curve that is being harvested, and this one shows the area that is being cut to meet that harvest level on this particular forest. We are of course now at

zero years and we will now start to harvest this forest very close to the limit that it can stand and this harvest level can be adjusted to anything of course.

You might note that the age-class distribution is assuming a different form than it did with the fire. We are now harvesting this little part of the yield curve here. Based on the harvesting, those stands are declining with volume the fastest. We can see the area starting to appear here and the volume once again is falling, of course, because of the shift in the age-class distribution across the yield curve.

Q. What age have we started out now, or are we at now?

A. It sounds a little ridiculous but we are at 310 years. It takes a long time for these things to stabilize out, but we have to think in the long term.

What we have of course with the age-class distribution now is what we call a rectangular age-class distribution. The product of harvesting at this end of the distribution, all the time when we harvest at this end sending it back to the beginning, and basically harvesting roughly equal volumes each year, and if we don't have too much site variation that can approximate also equal areas.

Of course the world isn't that simple; markets change, conditions change and we don't usually end up in 310 years not changing anything; however, that can also be handled. But this is just to illustrate the dynamics of the system and where it goes in the long term if we maintain a certain harvest level.

I can -- the model of course can enter any number of yield curves and age-class distributions and have them all interacting up there at the same time, but without colour it gets to be a totally confusing picture, so I won't bother with moving on to those.

I will move to an analagous model here. What we will do is now interact age-class and yield curve and we will try and get a three-dimensional view of change over time as we try different harvesting levels on a forest to try and ascertain at what harvest level we can cut without destroying our growing stock.

This is the age-class distribution we will be putting in, in this case it's in a bar chart. If you prefer to see it in polygonal form and like we have got up here -- not up here, but in the previous cases we had in this form. Up there I have got it in a bar chart form. Some people prefer one to the other.

MR. CASSIDY: Madam Chair, what Dr. Methven is going to do is a simplified version of the models found at pages 73 through 75. It is not identical, it is in fact simplified for the benefit to explain it, but it is the type of process that was used to generate these models.

DR. METHVEN: With that age-class distribution I will interact this particular yield curve. We can make any kind of yield curve we want, of course, by those "x" and "y" coordinates over the mass, so I will use this one.

I have got myself caught in a little fix here. I have got a run time error, which means I basically have to clear out. It will just take a moment.

---Discussion off the record

DR. METHVEN: Okay, we are back in business. Now, what I am going to do, as Mr. Cassidy said, is run through one single quick example of the kind of figures you will see in the back of Exhibit 1121.

Basically what we are going to do is, this forest, which will generate a growing stock from that yield curve and age-class distribution, is test a harvest level between 150,000 and 250,000 cubic metres.

This is a 100,000 hectare piece of land we are dealing with, and we will see what kind of harvest level this particular forest can sustain, a very simple one again for illustration purposes.

Now, basically what we have here is a three-dimensional graph again, if I can just look at the axes here. This axis up here is the axis showing the growing stock which is the measure of the forest that we want to keep healthy and keep in good condition, and so the numbers here represent cubic metres by ten to the minus fourth, so the 600 is actually 6-million; 1,200 is 12-million and so on.

On this axis here --

MR. CASSIDY: Q. You are referring to the axis moving from the center of the page to the right of the page?

DR. METHVEN: A. That is correct. This is basically the harvest levels that we are going to test from 150,000 through the 250,000 by 10,000 steps. The graph actually only shows you 20,000 cubic metre steps, but it will generate 10,000 steps when we start running it. This axis along here --

Q. Which is the bottom axis?

A. The bottom axis is basically time into the future. So we are going to look at this

development from now into 200 years in the future at these harvest levels with that yield curve and age-class distribution I started with and see what happens to the growing stock.

That shows you what the growing stock will do at a 150,000 cubic metre harvest and, as you can see, it's slightly wavy and that waviness is really a product of the shifting age-class distribution against the yield curve.

We are now trying 160,000 and at 160,000 we are in good shape still, growing stock is staying up there.

Q. What do you mean 'up there'?

A. It's staying up above zero, so we still have growing stock that we can work with and we can keep our mills running and our people employed.

Q. All right.

A. And I will just run the model - 150, 160, 170, 180, 190, 200 - and right now we are around 210. We can see we are running into trouble. Basically what this says is that this forest cannot sustain that harvest into the future and that around here we started getting into deep trouble.

Q. Around where, Doctor?

A. Around 60 to 70 years in the future,

if we kept trying to harvest at that level our growing stock is obviously starting to crash here and we are going to be in great difficulty if we want to maintain our system.

Q. By crash you mean below zero approximately?

A. Down to zero, when I say crash, yes. It isn't quite there but it's awful close. We are there now.

Q. At what harvest level?

A. This is at -- it's at 240 I think. Yeah, close to 240. So this is just an illustration to provide us with some information as to where the danger levels are - one could call it of course a sensitivity analysis if we want to be fancy about it - and if we are going to be harvesting at some level into the future, we don't want to ride along the edge of this precipice because any fire or bad fire seasons or bad insect epidemics is going to kick us right over the edge, which is one place we do not want to be. So obviously when we are playing with these scenarios, we back off based on our judgement and harvest at a level that will maintain a healthy growing stock and keep the forest in a state that will produce all the benefits we expect from it.

That really concludes my presentation, Madam Chair.

Q. The other models that are referenced in the witness statement are the result of inputting different variables and seeking different results; is that correct?

A. That is correct. Currently of course a major initiative for example is wildlife habitat supply. That involves building yield curves that don't have cubic metres per hectare on the "y" axis but have some kind of habitat quality index.

Q. The model you just produced is not reproduced or any way in this witness statement unfortunately, that is an analagous model -- a simplified model of that found on page 73, Dr. Methven?

A. That is correct, yes.

MR. CASSIDY: All right. And I would now like, Madam Chair, just to refer to a few final matters before we break for lunch, and that is some matters raised in the scoping session.

Q. And, Dr. Methven, I would like to address some of those matters to you. The Board in the scoping session with reference to page 48 of the witness statement indicated as follows:

We understand the description of a fire

cycle but we are a little confused in the third sentence which reads:

"A fire cycle is the time it would take for fire to burn over an area equivalent in size to the area of concern. Is that the area of the undertaking?"

Can you assist the Board on that?

DR. METHVEN: A. Yes. When I say area of concern, it was probably a poor choice of phrase. Really it means that any area that is delineated on the landscape for a particular management purpose, it can be a management unit, it could be a park, it could be the area of undertaking.

Q. And also in the scoping session the Board Chair referred to page 52 of the witness statement, and I think you dealt with the question of clearcutting and harvesting -- you dealt with that earlier in our evidence at the beginning; is that correct?

A. That is correct.

Q. And on page 72 the Board asked:

In the second paragraph there is reference to the dominant historical disturbance has been fire with windstorms assuming greater importance in the more

Southerly mixed wood and tolerant hardwood forests.

And the Board said:

"We wanted you to confirm with us that much of the evidence that the Board has heard to date concerning blowdown, which is what we think you are getting at with respect to windstorms, has been primarily about the boreal forest and specifically the problem with blowdown of spruce. We would like to know how that fits in with this statement about windstorms assuming greater importance in the more southerly mixed wood and tolerant hardwood stands."

And could you please assist the Board in that regard?

A. Yes. Blowdown is of course prevalent in the boreal and the Great Lakes/St. Lawrence and what I meant has greater relative importance, relative to fire. So that in the southern part the windstorms will have a greater relative importance as a disturbance relative to fire than in the boreal, but both the boreal and the Great Lakes have probably roughly equal wind disturbance and blowdown.

Q. Thank you. Now, Dr. Methven, I would

like to ask you about the appropriateness of certain prescriptions in your view, and I would like to ask you what your view is about the appropriateness of a prescription for jack pine that it should be clearcut less than 100 hectares in size if logged by conventional harvesting methods and for full-tree harvesting strips no wider than twice the tree heighth.

Would you assist the Board in that, what your view is?

A. I can think of no ecological reason at all for setting those prescriptions of 100 hectares in size.

Q. When you say reasons, you mean basis?

A. Basis, yes.

MR. MARTEL: Mr. Cassidy, would you give me back the total prescription you had: Clearcut less than a hundred acres in size, I believe tree-length --

MR. CASSIDY: Hectares in size if logged by conventional harvesting method. For full-tree harvesting, strips no wider than twice the tree heighth.

I am going to have to leave my microphone off or else we are going to suffer that ear-splitting feedback again, Madam Chair.

Q. Dr. Methven, could you comment on the

appropriateness of a prescription for black spruce requiring that it be strip cut with strips no wider than --

MR. FREIDIN: Slow down.

MS. SEABORN: And speak up a little bit please, Mr. Cassidy.

MR. CASSIDY: Touche!

Q. All right. Could you comment on the appropriateness of a prescription for black spruce requiring it to be strip cut, with strips no wider than two times the height of the tree, an exception for less productive sites where strips shall not exceed one and a half times the tree height, a minimum of a three-coupe strip system shall be used - coupe is spelled c-o-u-p-e - with harvesting of successive coupes only after the last harvested strip is producing viable seed.

DR. METHVEN: A. This prescription sounds like a strip shelterwood cut for black spruce. Spruce is a pioneer species, as I have already mentioned, it regenerates in nature through large openings, therefore, I don't see any real ecological reason for this shelterwood cut.

Some of the consequences -- or two of the consequences would be of course blowdown in the

residual strips to which spruce, being a shallow-rooted species, is very prone and, of course, these little narrow strips on the landscape create a pattern that is very, very small, quite unnatural.

Q. I would like to come back to the jack pine prescription that I referred to you earlier. In your view, is there any biological basis for the prescription that I referred you to?

A. I cannot think of one, no.

Q. With respect to white pine, can you offer your view on the appropriateness of a prescription requiring uniform shelterwood cuts?

A. Uniform shelterwood is certainly an appropriate method for the regeneration and management of white pine using natural regeneration; however, it does not have to be a uniform shelterwood; i.e., the removal of individual trees over the stand, it could also be for example a group shelterwood which is the removal of groups of trees and the latter would probably be more appropriate, particularly for red pine.

Q. And can you comment on the appropriateness of a prescription for poplar requiring clearcuts up to 50 hectares?

A. Once again I can see no

biological/ecological reason for the 50-hectare limit.

Q. And a prescription for white birch with the same restriction of clearcuts up to 50 hectares; in your view, is that an appropriate prescription?

A. Well, it could be appropriate if one has some particular objective but, once again, I don't think it has any biological/ecological basis.

Q. All right. I would like to turn to you, Mr. Hopkins, and ask you to comment on an issue relating to strip cutting and; that is, can you assist the Board with any operational difficulties that arise as a result of strip cutting?

MR. HOPKINS: A. Yes, I can. I will describe the operational difficulties that would occur on black spruce sites, using our area as an example, where the strips are narrow strips approximately 100 feet wide and based on a three-coupe system.

The rigid geometric nature of the layout tends to ignore topographic and natural boundaries, for example -- and examples will be rock ridges running crossways to the strips, dropoffs, alder swales, blowdown orientation, small water drainages, and also the fact that there may be an intermixture or a variety of smaller stands that should not be harvested because

they are too young or unmerchantable that would be difficult to take into account with this type of rigid geometric layout.

In our case the length of these strips would be 700 to 2,000 feet in length and, as I said before, only a hundred feet wide. This would be a very unnatural layout for harvesting.

As a result there would be some operational difficulties in the strips and I will call these in-strip difficulties for the felling phase, the forwarding phase and, if necessary, a site preparation phase following the harvesting.

Specific to felling there would be problems in avoiding the felling of wood within a strip into adjacent standing timber or in subsequent coupes there would be problems avoiding falling trees into established regeneration.

On a manual felling system - that is with chain saws - there is difficulties in controlling the direction of the falling timber and there is also the problem of confining the feller or the man using the chain saw to a certain direction of falling when he has to deal with changing wind directions and changing lean that is predominant in the stand that he's cutting. In other words, he could be forced to cut against a

natural lean of the majority of the trees in the stand.

Mechanical system, such as feller bunchers, have difficulty again laying down -- cutting and laying down the trees within the strip and, in fact, the trees are usually laid down at right angles to the direction of the strip or would be laid down at right angles so, therefore, part of the bunches being formed would definitely have to fall outside of that hundred foot wide strip.

For the skidding phase, this pattern would take away from the on-the-ground judgment of the skidder operator to choose a most suitable route. If -- on those narrow confined strips, if there was a small wet patch, because of the confining nature of the corridor, he would not be able to choose a more appropriate route to avoid damaging a site -- a small area. It would cause the skidder or forwarding function problems in turning and manoeuvering, and it also would -- in our case these narrow strips would probably cause us difficulty in using the advanced growth -- protection of the advanced growth methods for natural regeneration that I have referred to earlier.

Another problem in the forwarding phase is the location of skidways. The skidway would be located at the end of the strip, at the road, and it

would confine -- the choice of skidway location would be confined by the strip being cut. If the location was inappropriate because of the soft site or a localized condition that made it not suitable for a skidway, then the operator would have difficulty finding a more appropriate place to pile.

Site prep, the same comments as for forwarding would apply, in that the machinery being used, if site preparation is required in the strips he would find -- would have difficulty in manoeuvering and turning.

Other operational difficulties. This system would require increased road construction and maintenance and would result in moving people and equipment more often, more frequently, and it would have an impact on major infrastructures such as the life of a live-in camp.

Finally, as the Board has already heard from evidence given by the Ministry of Natural Resources, there are problems with this type of system with regards to blowdown and up to 10 per cent of -- losses due to blowdown have been up to 10 per cent in as short a period of time as four years and, as well, wood in narrow strips that is left standing in our experience has tended to suffer higher mortality than

normal and just dies on the stump.

Q. Mr. Roll, before we break for lunch, I would like to come back to you and deal with another matter raised in the scoping session by the Board and that is:

"The Board is interested..." and I am quoting the transcript, "...in having a better description of to what extent Industry and the Ministry of Natural Resources work together in defining what the silvicultural options will be.

Is it the case that it is the plan author who puts together that table..." and I believe the Board was referring to silvicultural groundrules,

"...with knowledge generally of what the MNR options are or is MNR more actively involved in suggesting what a harvest method might be and the specifics of the silvicultural options and regeneration options."

I wonder if you could assist the Board in that regard?

MR. ROLL: A. Yes. The plan author, referring to the author of the timber management plan

for a particular management unit, may or may not be involved in those specific negotiations. It's very likely that as a more senior forestry and planning person they would be but not necessarily. The process of negotiating the groundrules is a joint effort between the Industry and MNR. The appropriate people from both those -- both Industry and MNR get together and basically share information.

The Industry would, in terms of harvest and those kinds of activities, would describe the kind of equipment they are currently using, the combinations of that equipment, the style of harvest, if you like. There will also be discussions of any upcoming developments of equipment that might be contemplated over the next five-year period.

The group of people would also look at such things as some of the silvicultural records from past operations, the relative success of various treatments on different sites, most likely as evidenced from the stocking surveys, the fifth-year assessments and so on.

They would also discuss the current level of silvicultural knowledge and particularly as it might be applied to the kind of sites and the kind of conditions in that particular management unit in that

particular forest.

After this so-called negotiation, which is really a sharing of information and a honing down of that information to specifics that are applicable to that particular forest, the MNR approves the groundrules. It goes through an approval process right through all levels of the Ministry of Natural Resources prior to inclusion in the approved forest management agreement.

Q. Thank you. And now could you summarize the evidence, Mr. Roll?

A. Yes, I can. I have six main points very briefly. The first, we are dealing with a dynamic market for our forest products, we are dealing with a very dynamic and a very variable resource in terms of sites and stands and so on. We are also dealing with extremely variable weather conditions. These are the operational realities.

The second point is that we have much experience in carrying out sound harvesting activities in our areas and we've successfully integrated other timber management activities with harvest. We have developed or contributed to the development of equipment and developed methods of use for this equipment which take into account other values of the

forest.

We carry out our harvest operations within the terms of approved timber management plans and annual work schedules. Approved forest management agreements including groundrules, within the terms of various guides, guidelines, manuals and within the terms of applicable federal and provincial legislation.

The fifth point. Within the terms of those last mentioned conditions or within the terms of those things last mentioned and given the variable conditions under which we operate and given our experience in operating under these conditions, we require site and situation specific flexibility to carry out our operations in an efficient and environmentally sound manner.

Sixth, as outlined by Dr. Methven, the silvicultural systems which we use are ecologically balanced and environmentally sound for the stands and species in which we operate. Some planning and careful implementation of harvest and renewal activities, as will be described in our industry panel No. 8, will ensure the renewal of this resource.

MR. CASSIDY: I believe it is time to break and that is all of my questions.

MADAM CHAIR: We will be back from lunch

at 1:35, Mr. Cassidy.

MR. CASSIDY: Thank you. I have completed my examination-in-chief.

MADAM CHAIR: All right.

Ms. Swenarchuk.

---Luncheon recess taken at 12:05 p.m.

---On resuming at 1:35 p.m.

MADAM CHAIR: Good afternoon. Please be seated.

MS. SWENARCHUK: Good afternoon.

CROSS-EXAMINATION BY MS. SWENARCHUK:

Q. My first question is for Mr. Murray and it arises out of your comments this morning and it has to do with the log prices that you gave us. Just a question of clarification.

When you gave that range of prices for various types of logs, was that any particular species or an average of all species? What species were involved?

MR. MURRAY: A. Ms. Swenarchuk, basically it was an average of all species in the tolerant hardwood, heavy hardwood range.

Q. Okay, thank you. Would you have an equivalent list of prices or estimates at least for white pine logs?

A. I would -- I don't have one right at my fingertips to calculate the price of the white pine log. They would be ranging somewhat in excess of those perhaps for hardwood, but very similar to what I call the quality one hardwood which I believe was...

Q. 12 to 15?

A. 12 so $15 per log. Now, the pipe logs generally contain more foot board measure than the hardwood logs, therefore, a log would be worth more per se because of that, but the per unit value is not dissimilar.

Q. Thank you.

And Mr. MacKay, you used an example this morning of marking off an area for a previously identify osprey nest. Can you tell me, first of all, what area that was done geographically?

MR. MacKAY: A. Yes. It was in the upper Spanish Forest. Relative to Sudbury it is about 150 miles due north of Sudbury.

Q. And what size of an area was marked off?

A. If I remember correctly it was about a 50-foot by 50-foot area.

Q. And for how long was that area left then?

A. We encountered the nest at the start of our road right-of-way cutting and we left the area untouched until we returned about, I would think, three and a half months later.

Q. So it was cut three and a half months later?

A. We cut the surrounding trees but left the nest tree alone.

Q. Now, I would like to turn to a question arising out of case study B and if you would turn to page 19, please, of the case study.

A. Yes, I have it.

Q. And we see in the third full paragraph this sentences, towards the end:

"With a huge surplus of aspen across the FMA areas, Eddy did not wish to pursue any option that would contribute to an increase in the aspen component especially at the expense of jack pine."

Now, my question is: What opportunities have been given to other companies to use this surplus aspen?

A. Every year we declare certain areas in surplus, as most FMA companies do I believe, and

there is a component of poplar in those surplus areas. Also, recently we've been given a directive by the MNR to make available, I believe, 30,000 cunits a year of poplar for any third party.

Q. And as of when have you had that directive?

A. I'm not sure of the exact date, but I first heard of it about -- I would think about a year and a half ago, a year ago.

Q. Okay. I think you have, do you not, Exhibit 68 which is the forest management five year review?

A. Yes, I do.

Q. So you are indicating that a surplus was declared; are you?

A. A surplus that was comprised not only of poplar but stands that would have a component of softwood in them as well.

Q. During that 1980 to '85 period?

A. Every year that I've been E.B. Eddy we have declared surplus areas. Now, the exact composition of those stands I really don't know for sure.

Q. Okay. Can you take a look then at the second paragraph on page 66 here and this refers

back to the previous page where a comparison is made of the maximum allowable depletion and the actual harvest over the previous years.

MR. MARTEL: What page is that, Ms. Swenarchuk?

MS. SWENARCHUK: The figures on the maximum allowable harvest is on page 65 in the chart at the bottom as compared to the actual harvest. You will see there is a considerable difference.

Q. Maybe we will just take a moment to look at those numbers.

You would agree with me, Mr. MacKay, that we see for the upper Spanish Forest a maximum allowable cut of 57,000 hectares and an actual harvest of 11,000 -- well, 11 1/2 thousand and for the lower Spanish Forest a maximum allowable cut of about 53 1/2 thousand hectares and a natural harvest of about -- close to 2,000 hectares.

MR. MacKAY: A. Yes, I see that.

Q. Then on the next page, in discussing this difference between allowable and actual harvest, we see on the fourth line of the second paragraph the writers of this review said:

"We suspect that another cause would be a lack of incentive to declare any

surpluses. Under the terms of the agreement, no penalty for failure to utilize the planned harvest cut are applicable during the first five years. Realizing that little can be done to change history, the committee reviewed those sections of the 85-90 operating plan to see how the matter was addressed. We found that the surpluses have been declared. Theoretically this volume is available to others. Generally speaking, this surplus material is in mixed inaccessible stands."

So with regard then to surpluses including aspen surpluses, they say the volume is available to others theoretically. Do you know whether in fact other operators have been able to use that surplus?

A. Yes, as I have mentioned, third parties have come on to our areas to utilize those stands.

Q. The aspen stands?

A. Yes.

Q. Do you know what proportion of them have been utilized in that way?

A. I couldn't give you that number, no.

Q. All right. Then the last line in this paragraph...

---Discussion off the record

MS. SWENARCHUK: Q. The last line of that paragraph says:

"Generally speaking, the surplus material is in mixed inaccessible stands."

Now, does that accord with your experience, that in fact the surpluses are often inaccessible?

MR. MacKAY: A. Yes, that is true, that often we declare areas that are not accessed by roads inaccessible. Inaccessible, I mean that's I'm referring to, not accessed by roads.

Q. All right. So then these are stands that are theoretically harvestable once roads are built; is that correct?

A. Yes.

Q. They are not inaccessible by reason of the terrain, for example?

A. Oh, no.

Q. All right. Now, keeping in mind those figures, could we turn for a moment to page 41 of your case study and to the second paragraph and the

last sentence in the second paragraph:

"A company such as Eddy, which faces major declines in the MAD once the current surfeit of overmature timber is harvested, requires the intensive management treatments described in this study."

Now, given the large disparity we have seen between maximum allowable depletion and the actual harvest in those areas, why are you foreseeing such a large decline in the MAD?

A. I must say that I am not -- have not been involved with the MAD per se and that I wouldn't feel comfortable in answering that question. I would have to defer that to someone on the planning or management team.

MR. CASSIDY: I might add, just to assist Ms. Swenarchuk, Mr. Waddell - I don't know whether he will answer it - but he is going to appear in the next panel as another representive of E.B. Eddy -- I'm sorry, Panel 8. In addition, there is a panel member from E.B. Eddy on Panel 7, Mr. Buntz, you might ask those, just by way of assistance.

MS. SWENARCHUK: Q. I take it then you didn't author the case study section yourself?

MR. MacKAY: A. That is correct.

Q. I will try the next witnesses then.

MS. SWENARCHUK: I think this would be an appropriate time for me to file a number of interrogatories that I intend to use. (handed)

MADAM CHAIR: Thank you. That will be Exhibit 1124.

MS. SWENARCHUK: 1124, Madam Chair?

MADAM CHAIR: Yes.

MS. SWENARCHUK: Q. Now, my first question, Mr. Hopkins, pertains to the first interrogatory response on the page, that's Forests for Tomorrow -- excuse me.

If you want to list the questions for the purpose of the record, it is Forests for Tomorrow No. 7, MNR No. 2, MOE 5(b), FFT 3, 10 and 12. And of those the first one referred to, question No. 7 of FFT, was with regard to the Panel 4 case studies and the remainder are from Panel 6 materials.

---EXHIBIT NO. 1124: FFT interrogatory question No. No. 7 (Panel 4) 3, 10, 12 (Panel 6); MNR No. 2 (Panel 6); MOE 5(b) (Panel 6) and answers thereto.

MS. SWENARCHUK: Q. Now, my question, Mr. Hopkins, arises from the interrogatory response. Have you had an opportunity to read it?

MR. HOPKINS: A. Yes, I've had a preliminary look.

Q. All right. We asked for the sizes of the blocks and strip cuts used in part of your case study area and the answer provided those dimensions and my question is, how were those dimensions determined?

A. Those dimensions, roughly 500 feet wide by 900-foot wide blocks, is roughly equivalent to the historical size of a patch that's allocated to a piecework cutting crew, that's a two-man cutting crew with chain saw and forwarding the wood with a skidder.

There was no -- it's an arbitrary size of 500 by 900 foot and the block cut layout followed that pattern.

Q. You say historical data, from when?

A. I would -- I wasn't there at the time, but I would assume that the layout for the piecework gangs commenced about the -- would certainly be in place in the 1970s when the skidder came into being.

Q. And what about with regard to the strip cut, 264 feet by 900 feet, would the same criteria apply?

A. I would only assume that it was the original block layout arbitrary 500 by 900 foot divided

into two and this would have been -- as I said, the idea - the block cuts in that time - was to leave an adjacent seed source and of course it would have made that prescription, would have felt that that was an appropriate distance or strip width to allow for seeding in.

Q. Now, another question. I will direct it to Mr. Roll because I believe it comes from your case study area, but maybe anyone else on the panel can answer.

I don't think we need to look at it, but at page 69 of case study A there is a reference to the weight of the Koehring feller forwarders and reduction in their weight with redesign, 42,600 pounds -- to 42,600 from 52,200 kilograms -- I'm sorry, not pounds?

MR. ROLL: A. Yes, that's right.

Q. And I just wanted to clarify. I understand that will be the weight before they are loaded; is that not correct?

A. Yes, that's right.

Q. And would you have an estimate of the weight with the load or a range of weights?

A. Probably in the range of...

Q. My next question is, in case someone can start working on this one, the range of weights of

conventional skidders. Is there somebody who can give me an answer to that one?

MR. MacKAY: A. I think I can offer the second answer. Conventional skidders can range anywhere from I would think 15 to 20 ton range, that's Imperial measure.

Q. Thank you.

MADAM CHAIR: Excuse me, can you repeat that for me, please?

MR. MacKAY: From 15 to 20 tons.

MR. ROLL: Perhaps Mr. MacKay can assist me on the question regarding the feller forwarder as well.

MR. MacKAY: Yes. If it's a softwood load -- payload that that machine is carrying, which I think it would be in Mr. Roll's case, one cunit of softwood probably weighs in the order of 51- to 5,200 pounds in a full tree form, any form for that matter, and if the -- subsequently if it has got probably a five to six cunit load, if you are talking about the 330 feller, it's a simple multiplication of six times 51-, 5,200.

Q. It is another 25- to 30,000 pounds?

A. I would think 30,000 pounds would be it.

MR. MARTEL: The other was in kilos, though.

MS. SWENARCHUK: The other one was in kilograms, yes. We can all work out the conversion later.

Now, Madam Chair, members of -- and Mr. Martel, I decided that a great number of my harvest technique questions actually relate as well to regeneration results and - we had this debate back in Panels 10 and 11 of the Ministry's case - I will be deferring all of those questions into the regeneration panel. So most of the remainder of my questions then are for Dr. Methven with regards to his paper.

Q. Just one question of clarification from this morning, Dr. Methven -- several. You referred to the fact that by 1987 the size of classes for prescription of fires has changed and that as of 1987 over 80 per cent of the fires were over 1,000 hectares, and then you talked about 48 per cent were 1,000 to 10,000 hectares.

Now, is that 48 per cent of the numbers of fires or 48 per cent of the hectares burned by fires?

DR. METHVEN: A. Yes, that's an important point if I could just clarify. When I gave

you those numbers those were for 1986, that one year.

Q. Yes.

A. That is 48 per cent of the area was burned by fires of that size, so it is area not numbers. So of the area burned, so much per cent was burned by a particular size class.

Q. And you made reference this morning to constraint management in harvest of 130 hectares and what it's doing to the landscape. Are you assuming that harvesting in Ontario is limited to openings of 130 hectares?

A. Yes, most provinces have constraints on harvest sizes.

Q. Are you assuming that harvesting in normal operating areas in Ontario is normally limited to 130 hectares?

A. That was my assumption unless there are other considerations such as a lot of budworm kill and salvage operations, as well as other reasons for extending it.

Q. It is my understanding, Dr. Methven, that limitations to that size of harvest only apply in certain areas where moose habitat is being promoted and that in fact much larger clearcuts are permitted in Ontario.

A. Yes, where the Moose Habitat Guidelines are being applied that's absolutely right, there would be a limit and, as I have mentioned, there are much larger cuts, but I think, as I understand it, they are for particular reasons.

Q. Well, I just wanted to clarify your basis for that assumption. I think various companies gave evidence on cuts, so...

Now, again from this morning's comments referring to adaptive management and adaptive environmental assessment management and said something to the effect that everyone is moving in that direction. Now, could you indicate who you had in mind as the everyone?

A. Well, I was thinking of the Province of Ontario for sure since they went through such a process two years ago which involved people from all aspects of the forestry scene.

Q. Well were you referring to the workshops led by he's even consults.

A. Yes I am.

Q. You weren't referring to for example the Ministry's <PHRARPBG> process overall as we have heard it out laid in this case or I just want to clarify exactly what you were referring to?

A. I am not conversant with the details of the Ministry planning I am afraid but I am sure those ESSA adapt timber environmental are workshop proceeding certainly ly had in <TPHRAOUPBS> on <THRAFPLT>.

Q. Now, a question relating to the silvicultural prescriptions which Mr. Cassidy put to you this morning and their ecological appropriateness, I guess.

Can I ask you to consider the prescriptions in this light: That if the option of wide-spread artificial regeneration including planting were eliminated or became less available to managers in Ontario, so that quite explicitly they were forced to depend more on natural regeneration techniques, would you find those silvicultural prescriptions more appropriate?

A. No, I would not.

Q. And could you indicate why?

A. In the case of jack pine, whether it's a hundred hectares whatever, you would'nt get natural regeneration from the slash and size of the area. It wouldn't make any difference whether it was 10 or a hundred or whatever, you won't get seed from the edge of jack pine to any degree that will give you

a fully stocked stand.

Q. And what about black spruce?

A. Black spruce, that depends where we are. In the lowlands of course we have advanced layering and it doesn't matter again what size it is, the advanced layering is the advanced layering will be there regardless.

Q. And upland sites?

A. In upland sites if you want to regenerate with seed, then you have to be able to provide a seed source.

Q. And what will follow from that?

A. You could either spread it artificially or you can get it from the edge of the surrounding forest. The seed dispersal distances for spruce are approximately about a hundred metres depending on the orientation and wind directions and what have you.

Q. Now, the scenario that I described which involved much less artificial regeneration than has been practiced over the approximately 10 years of the FMAs in Ontario, I suggest to you is similar to the regime that applied in Ontario prior to this influx of cash resources into artificial regeneration; in other words, I ask you to turn your mind now to the extent

that you have had an opportunity to familiarize with this subject -- this summary subject, to success in regenerating coniferous species after clearcutting prior to the increased use of artificial regeneration.

Are you satisfied and is it your position that we should accept or consider satisfactory the regeneration rates that were obtained before the artificial regeneration was more middlized?

A. This is really difficult for me to answer because this is very site and specie-specific. If I was to deal with jack pine, for example, there are ways of regenerating jack pine, they succeeded in the past as they succeed now; and they failed in the past too sometimes.

Q. And what about black spruce?

A. And the same for black spruce. The original logging of black spruce of course was done with horse logging and a lot of regeneration was from advanced layer regeneration, which is precisely what Mr. Hopkins described as what they are doing now with their modern machinery, is in fact saving that advanced regeneration, using that to regenerate the forest.

Q. Well, there has been evidence before the panel over the last couple of years in various forums that in the period before the signing of the

FMAs and in the regeneration of logged areas there was in Ontario, as perhaps elsewhere, a considerable amount of species conversion and much higher proportions of aspen and balsam than had been present in the conifer stands originally harvested.

Would you agree with that position?

A. If I may just check on your question, that there was more hardwoods in the stands originally than there are now?

Q. No, than in the stands that regenerated prior to the FMA system and after logging, that in many of those regenerating secondary stands there was a much higher incidence of aspen and balsam than in the original conifer stands of particularly black spruce or jack pine.

A. I wouldn't want to commit myself on that. The aspen is a relatively short-lived species and you have many mature stands out there and if there had been aspen in them they are long gone. So I would have no idea what the trend would be.

Q. Do I take it then that when you speak of the ecological appropriateness of silvicultural prescriptions it's with the assumption that, for example - let's talk about our two major species - jack pine and black spruce can be successfully regenerated

to stands of similar species and density after logging naturally without anincreased incidence of aspen and poplar and balsam. Is that your view?

A. That is my view.

Q. And do I take it then that you have not specifically studied that those regeneration results in Ontario for the pre-FMA area?

A. No, I have not specifically studied the situation both pre- against post-FMA area, no, I have not.

Q. Now, I am going to ask you a number of questions out of your papers and perhaps you would like to turn to it at page 22 of Exhibit 1121.

No, sorry, Dr. Methven, it's your own paper you are looking at now at page 42 of Exhibit 1121 which is the Panel 6 witness statement. Do you have that?

A. Yes, I have that.

Q. Now, would you agree with me initially, Dr. Methven, that one of the primary reasons for fire suppression has been the preservation of timber for timber management harvesting purposes?

A. That is correct, also to save life and property.

Q. Yes. And probably, particularly in

those large areas that are relatively remote from human habitation, that a primary purpose would be fostering of the forestry industry in preserving the timber?

A. On those areas that are committed for timber management, yes.

Q. And would you not also extend that to areas that presumably will be committed to timber management in the future?

A. Well, there are large areas in northern Ontario that aren't under maximum suppression at this time.

Q. Where are those areas?

A. In the north.

Q. And is that within the area of the undertaking, do you know, or outside of it?

A. I would think it's outside it, but in the fire management policy of Ontario there is the opportunity to exercise judgment here as to how you manage suppression of fires in the north; whether it's nothing, no property values, no life and the forest is cycling normally, then sometimes these fires are observed and not suppressed.

Q. Now, you have provided us both in your paper at page 47 and then further in your response to the Ministry of the Environment's Interrogatory No.

5(e), which is at page 3 of Exhibit 1124, with considerable detail about the frequency and extent of fires.

And can I just clarify, first of all, would you have any idea to what extent the fires you brought to our attention occur in those areas that are not subject to fire suppression?

A. No, I am sorry, I do not. These are general public statistics that I have used here.

Q. Now, on page 43 of your witness statement you have indicated in the first paragraph that:

"Regardless of which benefit(s) or combination of benefits are desired or decided upon, the forest must be managed to produce them."

Now, would you agree that part of that management may include leaving wilderness areas undisturbed by humans?

A. Absolutely.

Q. Is that part of your definition of management?

A. Yes.

MADAM CHAIR: Ms. Swenarchuk, are we on page 47?

MS. SWENARCHUK: 43 now, the first paragraph.

MADAM CHAIR: Thank you.

MS. SWENARCHUK: Q. And in the second paragraph you have indicated:

"The problem faced by the Industry is how to continue to produce the benefits demanded by society, how to stay in business to generate the revenues necessary for resource management..." et cetera. Now, isn't the primary problem for Industry production of revenue and profits for its shareholders?

DR. METHVEN: A. No. Well, I always regard the primary business of business is to stay in business.

Q. And that includes generating sufficient profits to generate sufficient capital to stay in business?

A. Certainly, if you want people to invest.

Q. Now, in the next section of the paper having to do with The Changing Forest - Death and Renewal, I think you talk about, at the bottom of page 44, that in the boreal forest of Ontario - this is the last paragraph on page 44:

"In the boreal forest of Ontario... with its harsh and variable climate and often relatively poorly growing conditions, adaptations of trees tend to be towards the physical environment rather than to the biological environment."

I think you also talk in your other paper about renewal and regeneration taking place on a large scale.

And then back on page 43, you indicate in the first paragraph that:

"...a jack pine tree were to die of old age, the population would suffer since the conditions for renewal would not be met."

Now, would you agree with me that in fact individual trees do constantly die and fall and that that all is part of the life and death sequence that affect trees' nutrient cycling within the forest?

A. Yes, but it will not contribute to the renewal of the forest.

Q. When you speak at page 44 of adaptations towards the physical environment rather than biological environment - that's in the last

paragraph on page 44 - would you not agree that fire interacts with biological factors, for example, the seed release from serotinous cones; is that not a biological factor?

A. Absolutely. Adaptations to fire are biological adaptations, yes.

Q. And also that fire contributes to the suppression of poplar in regenerating conifer stands?

A. Pardon me?

Q. That fire contributes to the suppression of poplar in regenerating stands?

A. No, fire stimulates regeneration of poplar.

Q. That's your position; is it?

A. Yes.

Q. Now, do you agree that the quality of regeneration after fire varies according to the size and intensity and severity of fires?

A. Would you repeat the question, please?

Q. Would you agree that the quality of regeneration after fire varies according to the size, intensity and severity of fires; where size refers to the area burnt, the intensity refers to the energy output of the flame front, and the severity refers to

the amount of the organic forest floor material consumed?

A. I wouldn't use the word quality, it influences the density and it influences the species composition, yes.

Q. And would you agree that although the forest has evolved through disturbance as you discuss throughout, and particularly beginning at page 45, that any conceivable large area disturbance may not have identical effects on the forest?

A. No, it would not have identical effects, each disturbance is very unique, yes.

Q. And so while recognizing the importance of large area disturbance, would you not agree that it's necessary to study the particular type of disturbance in order to understand its effects?

A. Yes.

Q. So merely, for example, if a given silvicultural system affects large areas, as do some fires, that in itself would not constitute a scientifically valid reason to conclude that its effects would be identical to those of fires?

A. Nobody has concluded that the effects were identical.

Q. The effects of any particular large

area disturbance.

A. Are you suggesting that the silvicultural system --

Q. Affecting large areas.

A. Affecting large areas would be identical to that of a fire? I am sorry, I didn't quite catch the question.

Q. Okay. I am merely underlining what I think you agree with, which is that the mere fact that any given disturbance, including the silvicultural system by virtue of the fact that it affects a large area, does not necessarily create identical effects to those of fire?

A. Oh, no, it merely has the same scale.

Q. Now, on page 46 you talk about the idea of fragility in stands. You indicate in the first paragraph towards the end of the paragraph that:

> "Thus mortality and renewal take place, not at the scale of the individual, but at the scale of the community and the landscape; not at the scale of fractions of a hectare, but at the scale of tens and hundreds of thousands of hectares. The net result is a mosaic of even-aged stands."

Now, would you agree with me that we look at or we decide the age of a stand by reference to the mature trees that are measured in the stand?

A. We measure the ages of a good sample of trees throughout the stand when we try to determine age.

Q. All right. Well, would you agree then that within any stand, even if it's described as an even-aged stand, there is frequently quite a variety of ages of trees in the stand?

A. That depends on your definition of variety. Most of the ages in the stands that we are talking about would be within 10 or 15 years of each other probably in our classification of even-age.

Q. All right. So that is what you have in mind when you talk about mosaic of even-aged stands?

A. Yes, they all originate from the same point in time.

Q. You just said our definition of stands. Who is the 'our' there?

A. Well, in the forestry profession we have -- we deal with age-classes and if the stand has two or less age-classes it's even-aged, if it's three or more, it is uneven-aged.

Q. Now, on page 47 and following you

talk about disturbance in Ontario, in the sixty three year period between 1925 and 1987, that Ontario then averaged 350 lightning fires a year that burned an average of 65,000 hectares approximately.

MR. FREIDIN: I am sorry, could you -- where are you referring to?

MS. SWENARCHUK: The first paragraph on page 47.

MR. FREIDIN: Thank you.

MR. CASSIDY: Can I just ask the Board if their copy of this Exhibit, if page 46 is out of order. Is 46 before 45?

MADAM CHAIR: No.

MS. SWENARCHUK: Q. Okay. So in that 63-year period we had about 350 lightning fires a year burning an average of sixty-five and a half thousand hectares, so that's an average; is it not, of about were 187 hectares due to fire?

DR. METHVEN: A. Each.

Q. Each. So is it not true then, Dr. Methven, that although some fires, as the numbers indicate, burn very large areas, hundreds of thousands of hectares, others are relatively small?

A. That is true.

Q. And, for example, in the chart that

you have provided on page 47 in which 1974 was the worst year for fires, the average size of area burned was about 937 hectares, and in 1976 the worst year for the numbers of fires the average was about 220 hectares?

A. Based on the division there, the number of fires and hectares burned, yes.

Q. And would you agree too, as these fires indicate, that our fire suppression has had considerable but still limited success; we still have large numbers of fires?

A. Yes, but it's down about 1/10th to 1/20th of what it would be without it.

MADAM CHAIR: Excuse me, Dr. Methven, what was your last comment about being 1/10th?

DR. METHVEN: Yes. That the reduction of fires has been 1/10th to 1/20th of what it would be without fire suppression.

MS. SWENARCHUK: Q. So there still are considerable areas of the forest that are being regenerated according to the natural processes that follow fire; is that not correct?

DR. METHVEN: A. That is correct.

Q. Now, in the last paragraph on page 51, Dr. Methven, in discussing silvicultural systems

you have indicated that:

"Thus the reproduction methods represent a continuum of opening sizes and distributions from 0.1 hectares to thousands of hectares depending on the precise management objectives in terms of the species to be favored and economic realities. No part of the continuum is any more ecologically valid than another since it can represent the blowdown of a single tree to a 300,000 hectare fire."

Now, the Board has heard evidence that in the boreal forest between 87 and 89 per cent of harvesting is by clearcut method, and would you agree with me that very little, if any, of that is at the level of cuts of about .1 hectare in the boreal forest?

A. Sorry, I don't understand the question.

Q. I take it you have a good general knowledge of harvesting practices in the boreal forest?

A. Yes.

Q. And would you agree with me that in this large proportion of the harvesting that is done by the clearcut method in northern Ontario, that very little of it, if any, would involve clearcuts at the

size of .1 hectare?

A. Yes, because if you are trying to regenerate .1 hectare won't do it.

Q. Well, you have also referred in that sentence to economic realities. Would you agree that the forest industry's concept of economic realities has some influence on the size of cuts as well?

A. Absolutely, if it doesn't violate the ecological principles.

MR. MARTEL: What was that last answer, please?

DR. METHVEN: Oh, I'm sorry. Yes, definitely, as long as it doesn't violate the ecological principles in the process.

MS. SWENARCHUK: Q. Now, on page 52 you have talked about clearcutting, what it is and what it is not. Now, I would like to review some possible differences between clearcutting and fire and ask whether you agree with these statements.

Do you agree that clearcutting does not emulate natural disturbance in these following ways: That especially when full-tree logging is done, it fails to leave a natural seed source on the site?

DR. METHVEN: A. That is true usually, yes.

Q. Now, I have been referred to a biological phrase which I had to define for myself and will for the Board, maybe you can. It refers to perennating rye zones?

A. Yes.

Q. Would you like to define that for the Board?

A. Many of the unstorey species in our forest are rye somatoa species; i.e., they have underground stems and new shoots develop from these underground stems.

Q. Now, would you agree that clearcutting differs from fire in that it fails to kill a significant portion of the surficial perennating rye zones and roots of shrubs, herbs and trees that compete with merchantable conifers?

A. No, I wouldn't. Many fires do not kill these rye zones and in fact that's the major means of reproduction of those understorey species in the face of fire.

Q. And are there fires that do kill them in your estimate?

A. Usually fires kill the top growth but not the peronating organs.

Q. And do you agree that in much of

boreal Ontario fire raises the soil pH and that that is helpful in the boreal eco-system for nutrient uptake as much of the boreal region is of rather acidic soil?

A. There is a temporary increase in pH, yes.

Q. And clearcut does not emulate that effect?

A. Not precisely, no, but there is a slight increase sometimes.

Q. And why is that?

A. Because of the increased decomposition rates, because of increased moisture and increased temperatures that result from the exposure of the forest floor.

MR. CASSIDY: I think I am now in the position of asking both Ms. Swenarchuk and Dr. Methven to slow down a bit so I can take some notes.

MS. SWENARCHUK: Sorry. Caught up?

MR. CASSIDY: Yes, thanks.

MS. SWENARCHUK: Q. Now, we have just heard some discussion today about the size and types and weights of equipment used in modern harvest operations.

Would you agree that there is no equivalent in fire for the manoeuvering across the

landscape of such large heavy machines with possible site damage resulting?

DR. METHVEN: A. Fire does not use machines, but I don't think it's the weight of the machine that's important as the pressure on the ground that we need to consider.

Q. And are you satisfied that modern harvesting equipment no longer creates any site damage resulting from weighty machines on the forest floor?

A. As we have heard in this panel, the machines are being designed to minimize that problem; of course, it hasn't been totally excluded.

Q. Looking at page 52 at the last paragraph, you have indicated that with regard to a microclimatic change that there is known evidence to support that it becomes more extreme with the size of clearcut and that once one is beyond the influence of surrounding trees the microclimate changes little if at all.

I don't quite understand what you mean by that. Are you saying that once beyond the influence of surrounding trees the microclimate is changed or is not changed at all? Would you explain that sentence?

A. Yes. Obviously the surrounding trees do exert an influence for some distance into the

clearcut depending on the orientation versus the path of the sun and the extent of their roots and their shading and what have you. Once you go beyond that influence, changes in microclimate are quite minimally.

Q. So you are saying that outside of the shelter area of the trees there is no change in the microclimate on the site as a result of clearcutting?

A. That is correct.

Q. You are saying there is a change in the microclimate in the area that is vetted by the sheltering trees?

A. Sheltering trees provide a shade for some part of the day, as I said, depending on the orientation.

Q. And how is that a change from the pre-harvest condition?

A. The pre-harvest condition you have a canopy.

Q. With greater shade; is that it?

A. That is correct.

Q. Could we look at page 54, the first sentence of the last paragraph:

"Clearcutting, therefore, is an ecologically sound method for promoting the regeneration and growth of a majority

of Ontario's tree species and ecosystems."

Now, I believe you disagreed with me earlier or with the position that in the pre-FMA area we saw large-scale species change going on in regenerating areas?

A. Change in what sense?

Q. Change from the proportion of merchantable conifer in the previously harvested stands?

A. That is a judgment I can't make because I don't know what it was in the early stages of development of the other stands.

Q. All right. So is it your view then that if clearcutting is used in the boreal forest as it is now used to remove large areas of conifer to get black spruce and jack pine, that those areas will regenerate naturally to black spruce or jack pine, a previous conifer species, without human intervention in the form of artificial regeneration?

A. It can be achieved by some procedures. In terms of jack pine, for example, if you leave slash on the site and you scarify and crush, create a seedbed and seeds release from their cones and cheap regeneration.

Q. Okay. So then your natural regeneration option would include site preparation but the use of slash as a seed source; is that right?

A. That is correct.

Q. And what about with regard to black spruce?

A. That's a little more difficult to achieve.

Q. All right. Well, can you go back to my question then and answer it. Is it your view that natural regeneration of black spruce stands after clearcutting can be achieved widely?

A. In the Clay Belt it can certainly be achieved very widely because we have a lot of advanced regeneration of layers. On other areas and outlining areas there is no advanced regeneration of layers, therefore, we use artificial means of regeneration.

Q. And again to return to the wording of my question, do I take it that it would be your view that good regeneration of black spruce on those upland sites without artificial regeneration techniques after clearcutting would not occur or would not be likely to occur?

A. Yes, it would be insufficient for full stocking, certainly.

Q. Now, again debating in the last paragraph on page 54 and talking about people like my clients who have something to say about the size of clearcuts -- it's a large passage, but I think it's best to read it all:

"Restricting opening size in Ontario's commercial forests is not a question of ecology but of tradeoffs between benefits, values and environmental impacts. For example, the limitation on size of clearcuts is usually applied as a constraint, and is often based on either aesthetic or wildlife habitat criteria. while these are perfectly legitimate, it must also be said that the aesthetic criteria often emanate from those not familiar with the scale of natural disturbance in the Boreal Forest, and the wildlife habitat criteria are often based on feelings and anecdotal evidence, rather than hard facts concerning relationships between habitat structure population dynamics."

Now, you haven't been qualified, and I take it you would not claim to be an expert, in

wildlife management in the boreal forest; is that correct, Dr. Methven?

A. Absolutely.

Q. Then on the next page you talk about smaller cuts - first paragraph on page 55:

"Smaller cuts require a more intense network of roads..." et cetera.

The last line in that paragraph is:

"...and the habitat requirements of other wildlife species may not be met."

I would like to know what species you are referring to? This is the last line in the first paragraph of page 55?

A. There are some wildlife species that my colleagues or wildlife managers tell me require large areas of uniform habitat. Caribou has been mentioned, a number of the warblers amongst the birds is another group that's been mentioned.

Q. Are you speaking of woodland caribou now?

A. Yes.

Q. And isn't their preferred habitat what my clients call old growth and what the other parties to the hearing may call mature and overmature stands?

A. It is mature stands, but mature stands only originate from young stands.

Q. If the species we are talking about here is woodland caribou, I simply want to clarify you have in mind then in this sentence a species which normally inhabits mature and overmature stands. Are there any other species that you have in mind?

A. Inhabit mature stands?

Q. That require larger areas?

A. I was thinking and I mentioned warblers as a group.

Q. Those two?

A. I am not a wildlife expert so there may be many more, I am not sure.

Q. Or there may not?

A. Or there may not.

Q. On page 56, Dr. Methven, in the second paragraph you have indicated that:

"Soil rutting and compaction can result from the use of the wrong harvesting system (particularly the off-road transport component) at the wrong place at the wrong time, but this is rarely an issue now because of the variety and design of harvesting systems available."

And then you go on to say:

"Bogged down machines make poor economic sense, and compacted soil creates silvicultural costs in an integrated system."

Now, is it your position then that rutting and compaction essentially no longer occur in the harvesting operations?

A. No, I would never say they no longer occur.

Q. What is the meaning of this sentence; to what extent does it concern you?

A. This is always a concern and it is a concern that is continually being addressed.

Q. I take it from the wording of the sentence that you consider this problem is now within acceptable limits; is that correct?

A. No, I didn't actually say that. I said it is a problem that most operators avoid because it doesn't make economic sense apart from the environmental problems.

Q. So you think it is largely avoided?

A. I think there is a very determined effort to avoid it.

Q. Now, with regard to silvicultural

costs in an integrated system, are you aware that in the FMA system in Ontario the silvicultural costs or a very large measure of them are actually paid for by the Ministry as opposed to the Industry?

A. Yes, I am aware of that.

Q. So to that extent that question of costs is not one in which Industry has integrated harvesting and regeneration rather the costs are largely carried by an outside party?

A. Yes, but as you have heard from Mr. Hopkins they have now instituted a system that uses -- minimizes those costs for everybody.

Q. You go on in this section to talk about nutrient cycling, Dr. Methven, and you begin with the proposition in the first sentence of the fourth paragraph on the page that:

"The problem is that our collective ignorance far exceeds our knowledge of Nutrient dynamics."

Now, with regard to that question, would you agree that one major conclusion of various researchers is that boreal forested ecosystems...

MS. SWENARCHUK: Are you having trouble hearing?

---Discussion off the record

MS. SWENARCHUK: Q. With regard to nutrient dynamics then that one conclusion of numerous researchers is that boreal forested ecosystems are nutrient limited especially with regard to nitrogen and phosphorus. Do you agree with that conclusion?

DR. METHVEN: A. I hesitate because I have a little difficulty because limited with respect to what, is my problem here.

Q. That we are essentially talking about an ecosystem that by comparison with some others that you refer to, for example the tropical ones, is relatively poor overall in nutrients?

A. Tropical ecosystems are often much, much poorer in terms of their actual nutrient capital than the ones we have here.

Q. So you do not consider the forested boreal ecosystem one in which nutrient dynamics is a limited factor within the system, you don't consider the poor in nitrogen and phosphorus, put it this way?

A. They are what they are, and ecologically that is the way it is. To say they are limited is in a sense a value judgment that I am having a little difficulty with.

Q. Well, let's look at it this way then. Do you agree that harvesting removes nutrients from the

site?

A. Yes.

Q. And that unlike fire, does not return them to the forest floor?

A. Fire doesn't necessarily return them to the forest floor.

Q. Does it not return some of them to the forest floor?

A. The loss of nutrients from fire can be quite great.

Q. And can they not also be quite great from harvesting?

A. In terms of the available pools, harvesting makes a relatively small pool within the whole ecosystem.

Q. So then is it your position that on a given site harvesting does not remove nutrients from the site?

A. No, harvesting does remove nutrients from the site which are in a relatively small pool within the ecosystem.

Q. And, therefore, that there are no -- is it your position then that there are no concerns arising from this removal of nutrients through harvesting?

A. This would depend on the site that we are dealing with and obviously we should always be concerned within a reduction context. If we are talking ecology, that's another story. We have to think of these two separately.

Q. Well, I am talking in terms of production?

A. Yes, particularly on poorer sites we should consider it, definitely, and you need more research to improve our understanding of some of the processes.

Q. All right. On page 57 you refer to several of the works of Foster and -- Morrison and Foster which the Board has see before and particularly their reference to whole-tree harvesting.

I am looking at the middle of the second paragraph.

"They have suggested that since nitrogen levels are deficient for optimum growth, whole-tree harvesting will yield more biomass but only at the cost of 'sacrific[ing] the enhanced growth that might be realized if those nutrients in the foliage and branches were returned to the soil" and that therefore

"conventional harvesting should be the preferred extraction method for this forest."

You go on to say:

"This is sound, conservative advice but it is still based on a number of assumptions and uncertainties. So, what can be done?"

And I think you go on to theorize that in fact whole-tree harvesting, as they have posed it, need not be limited; is that not correct?

A. And that would be my position at this time, yes.

Q. You conclude on the bottom of page 58 that:

"... presumably the landscape and its nutrient dynamics have reached some form of dynamic equilibrium." and that:

"Removal of trees in timber management cycle...does not constitute a new or radical departure in terms of nutrient dynamics."

But are you saying that in the relatively short time that we have been using whole-tree harvesting clearcutting methods that the landscape and

its nutrient dynamics have arrived at a dynamic equilibrium with that form and extent of nutrient removal?

A. No. What I am saying is that the landscape out there is probably burned a hundred to two hundred times since the last glaciation and that burning affects a much larger nutrient pool of any forest floor than harvesting does.

Q. All right. Well, with regard to whole-tree harvesting and the recommendation of Foster and Morrison to exclude it on certain sites - what you have described as sound conservative advice - wouldn't it be more prudent to use a very cautious approach to harvesting those types of sites with that method?

A. Based on my judgment and examination of the situation I think full-tree harvesting is a perfectly legitimate way to go. I don't think the evidence suggesting - which I can't find any of really - in terms of hard evidence that it's harmful or that any significant negative nutrient loss exists.

Q. So you would be prepared to accept full-tree harvest on any type of site; is that your position?

A. Yes.

Q. Could you turn to page 59 now,

please. In the last sentence on the page you have referred to your Figure 3 which is one of your computer models, and you indicate that:

> "This distribution has an equal area in each development class with no overmature age classes, unless special steps are taken to permit a percentage of stands to develop past their maximum volume."

First of all, is there a difference in definition between development class and age class?

A. Not really, we can consider them as similar.

Q. All right. So in Figure 3 then, we are looking at a forest that has essentially approximately equal volumes in all age-classes except the oldest?

A. That is correct.

Q. Now, we asked you in an interrogatory about that, and that's on page 4 of the package that was distributed, and we indicated that this looked to us like what had been described to us in this hearing as the normal forest.

I think I want to read these passages into the record. It is page 59, the last paragraph with reference to Figure 3.

And our question was:

"Figure 3 refers to the "normal forest". Is this the forest Industry wishes to achieve? If so, over what percentage of the forest land area?"

And the answer is:

"Figure 3 does not refer to the normal forest and this term was not used because it is an outdated concept and should never be stated as a goal. As a maximum sustainable harvest is approached, the age-class distribution approaches the rectangular form. It must be emphasized that this form is an outcome of a certain level of harvesting and not something that should ever be stated as an objective or something that the Industry wishes to achieve."

Now, I was very interested in that response, Dr. Methven. I don't want to impose upon you and the Board more of the long discussions that have occurred here with regard to the concept of the normal forest, but I did want to refer you - and you have seen these transcripts - to a number of more recent comments

about the normal forest made by Ministry of Natural Resources' witnesses and ask for your comments on them.

MS. SWENARCHUK: Madam Chair, Mr. Martel, I am now looking at transcript No. 143 from October 4th, 1989 at page 24489. This is when I was discussing with Mr. Kennedy the wood supply runs in the Red Lake Plan, and at lines 7 -- commencing at line 7 on page 24489 Mr. Kenny said:

> "We believe that is it possible to have a sustained yield on that land base and that we have to bring the forest into a managed state which has been described earlier by Dr. Osborn as the normal forest."

And then on page 24492, I was discussing with him the degree of fluctuations in wood supply within that plan and he indicated::

> "There will be a continous supply and the level will fluctuate and the level will fluctuate for a variety of reasons, one of which is the age in which the trees are harvested during that first rotation as we move towards the normal forest, it will also fluctuate on the basis of which particular stands are chosen and

what the makeup of these individuals stands are..." et cetera.

It has been our impression that the management approach in this province has been to move the forest towards a managed forest which the Ministry has described as the normal forest. Now, can I have your comments on that, please?

DR. METHVEN: A. I suppose my position would be that we're living in an extremely dynamic and changing world and --

Q. Could you speak into the mike, please?

A. I'm sorry. That we are in a very dynamic and changing world - and when I say world, I am talking about the social situation, the environmental situation, the market, the business, the landscape out there - and that, therefore, we should focus in an adaptive kind of a format on the state of the forest over time continually in terms of growing stock or habitat or whichever measures we want to use, and the other thing we need to focus on, of course, is wood supply, and that if we focus on these two things and practice adaptive management we should have a good control over the system.

In terms of the "normal forest", this I

regard as an outcome if through some miracle we were to sustain the harvest at some constant level for a long period of time, which is highly unlikely to occur I would suggest.

Q. And why is it unlikely to occur?

A. Because of all the dynamic changes that I have just mentioned in terms of markets and the forest and social perceptions and environment and climate, and nothing stays on a constant plane for any period of time in this world.

Q. So you think that it is unrealistic -- am I understanding you correctly, are you saying that you consider it unrealistic to be focusing on or moving towards the concept of the normal forest that we have been hearing about?

*** A. I think it's really a difference in emphasis. The idea of the normal forest is to provide some measure, I think, that the resource can be sustained into the long future, and that is what the concept is being used for.

All I am saying is, I am looking at it in a slightly different angle I'm saying now, and in terms of the way the world works and the things we need works on the state of the forest at any point in time, its reactions and interactions.

Q. What exactly makes it an outdated concept?

A. By focusing on a single objective it is awful hard to practice adaptive management and keep your mind on all things as they are changing; therefore, it is certainly a measure of sustainability, but I don't think it would be wise just to look at that as an objective within an adaptive management context.

Q. Thank you.

MS. SWENARCHUK: Three o'clock is it, Madam Chair, for the break?

MADAM CHAIR: We can break now or at 3:10 usually. Are you starting into a new area?

MS. SWENARCHUK: Yes.

MADAM CHAIR: We will break now for 20 minutes.

MS. SWENARCHUK: Thank you.

---Recess taken at 3:00 p.m.

---On resuming at 3:20 p.m.

MADAM CHAIR: Thank you, be seated.

DR. METHVEN: Madam Chair, is wonder if I could clarify a small point with respect to the evidence I gave.

MADAM CHAIR: Yes, Dr. Methven.

DR. METHVEN: Thank you. I think I

answered a question, Ms. Swenarchuk, with respect to --

MR. CASSIDY: Could you speak up a bit.

DR. METHVEN: Sorry. I think I answered a question with respect to whole-tree harvesting and I didn't give an answer with respect to full-tree harvesting, I think...

MS. SWENARCHUK: Q. You are saying the same implies then to --

DR. METHVEN: A. No, it does not. I have no opinion at the moment on whole-tree harvesting because I have very little evidence on it. It involves removing all the roots which involves another nutrient pool and also involves a major site disturbance.

MR. FREIDIN: Madam Chair, just for clarification, I think the question which was asked about the Foster and Morrison article, and the evidence of the Ministry on that is that the Foster and Morrison article, although he uses the phrase whole-tree, he was in fact describing full-tree.

MS. SWENARCHUK: Q. In the sense that the word is used in Ontario?

DR. METHVEN: A. Yes, interchangeable.

Q. Now, a number of questions about the modeling at the end of your paper, Dr. Methven.

First of all, on page 63 in the last

paragraph on the page you state in the first sentence the assumptions on which the model is based.

"The model assumes that the forest is composed of even-aged stands created by fire and/or clearcutting, that all stands regenerate after disturbance, and that wildlife populations are a function of the age class distribution."

Now, I would like to know what relationship this model has to what, in your view, is occurring in Ontario? Are you assuming that in Ontario in practice all stands currently regenerate after disturbance?

A. No, not all stands regenerate after disturbance for various reasons. The adaptations are to particular disturbance regimes and if we move outside those particular regimes then there will be a problem.

Q. Is the model intended to depict the situation as you understand it to occur in Ontario, or is it simply a theoretical model with no relationship to any particular place?

A. It is certainly a theoretical model, but it's a model designed for people to sit around and explore their knowledge and the outcomes of various

scenarios. One can enter anything one wishes in the model.

Q. Do the assumptions as you have stated them in the last paragraph on that page, reflect in any way your opinions about what is currently happening in Ontario?

A. Stands are even-aged largely and stands regenerate after disturbance to a large degree, yes.

Q. And is it your view too that wildlife populations are a function of the age-class distribution?

A. That is certainly a major component of wildlife habitat, yes.

Q. Wildlife habitat or wildlife population?

A. The age-class distribution is a major component of wildlife habitat. Our knowledge at the moment, it falls short of being able to make direct links between habitat and population.

Q. Exactly. Now, you have indicated that your assumption is that wildlife populations are a function of the age-class distribution. Did you mean in fact that they are a function of habitat, or did you mean that the habitat is a function of the age-class

distribution; and it appears to me that you have stated quite categorically that the model assumes that wildlife populations are a function of the age-class distribution population not just habitat?

A. That is true, the populations are, but our ability to forecast the connection between the two is still somewhat tenuous.

Q. I believe you have been provided with a copy of Exhibit 381; have you not, Dr. Methven?

A. I am sorry, 381 doesn't ring a bell.

Q. Let me --

MR. CASSIDY: It's the ESSA Document, Dr. Methven, and you do have a copy of it.

DR. METHVEN: I am sorry, Ms. Swenarchuk. Yes, that is true, I have it.

MS. SWENARCHUK: Q. You have it in front of you then?

DR. METHVEN: A. No, I do not.

Q. Does someone have it? It looks like this? (indicating)

Now, we have previously had the problem, Members of the Board, dealing with this document that the most succinct summary which occurs in the beginning of it is on pages which are not numbered.

MADAM CHAIR: We numbered ours, Ms.

Swenarchuk.

MS. SWENARCHUK: Q. I am looking at the sixth page which talks about the general strategy for monitoring. All right.

Now, I don't want to necessarily involve you in what the ESSA study is all about, but I think everyone here will agree with me that part of what it was about was an analysis of how constraint guidelines in Ontario would affect certain resources including wildlife populations.

DR. METHVEN: A. That is correct.

Q. All right. You had a chance to review the study; did you?

A. Yes, I was also present at the proceedings.

Q. Okay, good. So if we look at the first paragraph under that topic, General Strategy for Monitoring, under that heading, partway down the paragraph we see:

"The guidelines are intended to provide for the protection of habitat from timber management activities. To say that the guidelines are designed to protect the resource value population from timber management activities implies that the

Relationship between habitat and levels of different resource values is known. Workshop discussions indicated however that this relationship is not well understood."

You agree with that; do you?

A. Yes, I do.

Q. "Habitat level effects may not imply effects at the level of the resource value."

Do you agree with that?

A. Yes, I do.

Q. "In fact the possibility that other factors may confound the results is highest when population level effects alone are measured. Likewise measuring levels of the resource value alone provide little information on the mechanisms by which the effect or resource protection occurred."

And it goes on to recommend that: "Where possible effects monitoring Studies must be conducted at both the habitat and population levels."

So I take it you agree with those

statements; do you?

A. Oh yes, I do.

Q. All right. So then with regard to the utilization of the model that you have displayed for us, would you agree that with regard to the wildlife population models that are at pages 67, 68, 69 and 70, that to the extent that the model merely measures habitat as affected by fire control, that in fact there is not a direct correlation necessarily between that habitat and the wildlife populations, but that that relationship is as uncertain as the ESSA study has identified?

A. Oh yes, absolutely.

Q. So then that is part of the assumption with regard to wildlife populations that is in the last paragraph on page 63?

A. Yes. This model was just for exploring our knowledge and interacting with the system and seeing what we could learn.

Q. All right. Then just with regard to the assumption again about all stands regenerating, are you saying that they regenerate to the same species and density that was there before?

What is your assumption at a more detailed level about the regeneration that is

occurring?

A. After fire, depending as you pointed out before, the density may certainly change from fire to fire; there may be different species depending on the severity of the fire, if it's a very severe fire then undisseminated seeded species could invade the stand and change the composition.

Q. So those are qualifications on the simple phrase that the species regenerate?

A. The stands regenerate but the species composition may change to some degree.

Q. And this model doesn't include such variabilities as site differences, forest floor development, forest diversity, all those other elements in a forest eco-system?

A. No, definitely not. This is a forest level strategic model.

Q. And it's based on, as you indicated this morning, age-class and yield; it's really a resourcel/supply oriented model; is it not, as opposed to an eco-system study model?

A. Oh no, you are exactly right, it is not an eco-system model.

MS. SWENARCHUK: Those are my questions.

MADAM CHAIR: Thank you, Ms. Swenarchuk.

---Discussion off the record

MADAM CHAIR: Yes. I don't suppose that Mr. Freidin or Ms. Seaborn are prepared to go ahead with cross-examination now?

MS. SEABORN: I certainly don't want to go ahead of Mr. Hanna with respect to this particular panel, Madam Chair.

MR. FREIDIN: I think I share those sentiments, Madam Chair.

MADAM CHAIR: All right. What we'll do, As it happens we have other matters to discuss, and shall we excuse the panel for the day, Mr. Cassidy?

MR. CASSIDY: Thank you, Madam Chair.

If one of those things is the matter of scoping for Panel 7, I would like to have a short break so I can consult Ms. Cronk with respect to any questions she may have arising from the statements of issues.

She is going to be handling Panel 7, as you know we got them late yesterday, and I have sent them down to her. I've not had the benefit since I have been here all day to consult with her. I have left a message asking her to get me her comments.

As a result, I need some time to try and get ahold of her and see if there is any questions that

she would like raised on the scoping session. There may not be, but if I could have an opportunity to do that, I would appreciate it.

MADAM CHAIR: All right. Shall we deal with the documentation issue that Ms. Swenarchuk has now and then take a short break and come back and do the scoping session?

MR. CASSIDY: Thank you, Madam Chair.

MADAM CHAIR: We also had a phone call from Mr. Colborne. He reminded us that we were going to receive the negotiations report next week, but we are not going to be here, so it will be the week of May the 1st and he will be at the hearing on May the 2nd.

So could we set May the 2nd as the date for that.

MS. SEABORN: I think, Madam Chair, when we met yesterday there were a number of other items like that those of us who were here discussed a particular number of dates that all of us would like set.

Perhaps we can do that after we deal with the documentation as well before we get to Panel 7.

MADAM CHAIR: Okay, thank you.

MR. CASSIDY: I think the panel should be excused now.

MADAM CHAIR: Yes. Thank you very much, Mr. Cassidy.

MR. CASSIDY: And we will start at eight o'clock tomorrow morning, Madam Chair.

MADAM CHAIR: Yes.

---(Panel withdraws)

MS. SWENARCHUK: Madam Chair, Mr. Martel, do you have before you the letter that I wrote on April 12th. I have extra copies if you require them. (handed)

MADAM CHAIR: Thank you.

MS. SWENARCHUK: Well, I am pleased to say, Madam Chair and Mr. Martel, that from my meeting with Ms. Murphy and Ms. Seaborn and Mr. Cassidy - and I have as well discussed these with Mr. Edwards, and Mr. Colborne just looked at the letter as well - that all counsel are in agreement with what I am suggesting, So there is no dispute about that.

In addition, they persuaded me that I should file some form of witness statement for non-experts which would probably be a brief summary of the evidence to be given. I will do that. I don't really see that those are appropriate for executive summary and all these other elements, but they would have a brief summary of the factual evidence to be

given for the purposes of disclosure to the other parties.

Now, that is really all I have to say about the documentation, unless the Board has questions.

MADAM CHAIR: No, we are happy that the parties resolved that, but what we will do is send out a letter with your letter saying that the Board has agreed to this proposal and it will go out to everyone on the parties' list and that is how we will dispose of it.

MS. SWENARCHUK: Thank you.

Now, Ms. Seaborn suggested, and we are requesting that particularly in view of the material that we will be filing, all the source materials for example which we will be filing with the Board, rather than distributing through the mails to everyone, that it would be particularly helpful if at the Toronto site we could have, as we've had here, a reading room that will be open, particularly during the day and if possible in the evening, but certainly during the day a reading room which would have all the materials. I don't know that that one can be transported there.

MR. MARTEL: Does the location make any difference?

MS. SWENARCHUK: Ms. Devaul thought that it might be possible to arrange it at the Highway Traffic Board. In any event, we are requesting that that be done, if it's possible.

Another matter we discussed is the question of constructing a record on the site visit since this visit will be part of our case, and my suggestion is simply that some form of shorthand transcript is probably going to be necessary, and perhaps again that is a matter that can be worked out with Ms. Devaul and the administrative staff, and that the cross-examination of that witness for the visit could occur back in Toronto in November when the witness is on the stand.

I would suggest in the alternative that if he was to be cross-examined on the spot, we go in August when the bugs are prominant and we will all be brief in doing it.

We also discussed that it would be helpful if we could perhaps even now set dates for statements of issues and perhaps scoping sessions for Panels 8, 9 and 10 and assure that all parties are notified of those dates and, as well, that the satellite dates be firmed up. I believe they have been in fact, but...

MADAM CHAIR: And they are in the letter that will be released tomorrow, and they are the same dates that we have looked at for the last few weeks.

MS. SWENARCHUK: And then our final discussion was about a date for a discussion on negotiations of terms and conditions, and I understand now that that will be May the 2nd; is that right?

MADAM CHAIR: Yes.

MS. SWENARCHUK: I think those are all my submissions on that, Madam Chair.

MADAM CHAIR: Thank you, Ms. Swenarchuk.

MR. FREIDIN: Am I correct in relation to the site visit that there will be an itinerary and a map and a witness statements as if it was a separate panel?

MS. SWENARCHUK: Yes. Those will be distributed 60 days before.

MR. CASSIDY: Madam Chair, if I can just speak to a couple of matters.

With respect to Ms. Swenarchuk's suggestions on documentation, as she indicated we have no objection to those. The one comment I would make in that respect is that Ms. Swenarchuk has agreed that copies of the documents that are referred to in those source books and copies of the documents that are in

the -- which would be in the reading room, she has indicated that she would advise other parties of the printer that will be available from her party for us to contact directly in the event we want to get copies, and I simply put that on the record because there may be other parties other than those who were in the discussion last night who may want to take advantage of that system of obtaining documents, rather than going to the Highway Transport Board reading room where we anticipate they will also be found and paying whatever photocopying charges they happen to extract, and I make that without any knowledge of what that might be.

The other matter I wanted to speak to was, as Ms. Swenarchuk indicated, the scoping dates for Panels 8, 9 and 10 and it appears that I might be able to be of some assistance there in terms of my projections.

On the assumption that we are in Thunder Bay on May 1st - which it now appears we will be - it may be appropriate to have the scoping session on Wednesday, May 2nd for Panel 8 with the requirement that statement of issues be filed by Tuesday, May 1st. I throw that out as a suggestion. Ms. Cronk will be handling that 8th panel as well and she would be here that week.

MADAM CHAIR: Mr. Martel is asking if the parties could get their statements of issue to the Board next week so that we could look at them; if we receive them on Thursday it would be less of a rush at the beginning of the week.

MR. CASSIDY: Thursday, April 26th, Mr. Martel?

MR. MARTEL: Because on the 1st we are going to be receiving the report of the negotiations and we will want to look at that.

MR. CASSIDY: On the 2nd? It's discussion on the 2nd.

MR. MARTEL: We don't receive the report until May the 1st though.

MS. SEABORN: I think, Mr. Martel, there has been one report filed with the Board, it was a letter sent from our office on behalf of all parties.

Just so you are clear, it's not my understanding there is going to be any further written material delivered to the Board on that date. What there are going to be are submissions in respect to when final terms and conditions should be filed by the parties, because that originally was slated to occur - end of April - the end of April and then that date was pushed back with leave from the Board.

So I don't expect there will be any written material filed with the Board.

MR. MARTEL: That's fine.

MR. CASSIDY: So that, as I understand it, the statement of issues for Panel 8 would be required on April 26th, the scoping session would be held on May 2nd which would be the same day we would have the discussion on the terms and conditions.

If I could just make a request, that with respect to --

MR. MARTEL: See, that is what I was trying to get away from, was the two issues on the one night.

MR. CASSIDY: Oh, I see. So you would the scoping session for Panel 8 on Tuesday, May 1st?

MADAM CHAIR: Yes.

MR. CASSIDY: All right.

If I could make a request of the parties when serving us with the statement of issues for the Panel 8, if they could -- everything comes to me. I do not anticipate being in my office on that day and, therefore, if they could address it to Eleanor Cronk at our office, the same fax number. It won't be fatal if it has my name on it, but it just would speed things up.

Dealing then with Panel 9, Madam Chair and Mr. Martel, I would think that the following week, the week of May 8th would not be rushing it if we set Tuesday, May 8th as the scoping session for Panel 9.

Our present anticipation is we would still be in Thunder Bay on that occasion on the assumption that Panel 7 will take longer than one week - I'm speculating but I'm assuming - and, therefore, perhaps it would be appropriate to have the statement of issues filed by Thursday, May 3rd.

MS. SEABORN: Could that be for 9A and 9B. There are two separate witness statements in relation to that panel.

MR. CASSIDY: I would think that the statement issues should go together for those, identifying as between the two of them. That would be Thursday, May 3rd.

MADAM CHAIR: Will you be leading that evidence, Mr. Cassidy?

MR. CASSIDY: No, Ms. Cronk will be leading that. I will be leading part of it, I should say, just part of 9A, but Ms. Cronk will be involved much more heavily than I will be on that panel.

That statement of issues can be addressed to me, however, because I will be in my office. So May

3rd would be the deadline for statement of issues and May 8th would be the scoping session.

And with respect to Panel 10, I don't see much point in doing that Panel 10 scoping until after Fort Frances, Madam Chair, and therefore would suggest that the Panel 10 scoping not occur until the week of - Ms. Devaul has provided me with a schedule and I want to confirm we are sitting - yes, the week of May 29th, and if I could suggest that the statement of issues be submitted by Thursday, May 24th and the scoping session be held on Tuesday, May 29th.

I think that would probably be the best guess I can give at this point. So May 29th for the scoping and May 24th for the statements.

Is it your intention, Madam Chair, for Ms. Devaul to send out a notice containing these dates?

MADAM CHAIR: Yes. I think we will also send out a schedule until June.

MR. CASSIDY: Which we have in our possession, Ms. Devaul provided at the break.

MADAM CHAIR: All right. We will send these to you and both pieces of paper to all the other parties.

Thank you, Mr. Cassidy.

MR. CASSIDY: Thank you.

MADAM CHAIR: How long do you need, Mr. Cassidy? Do you want a 20-minute break?

MR. CASSIDY: It's ten to four now. If I could have until 4:15 I would appreciate it. I am hopeful there is a message on my machine from Ms. Cronk; if not, I will have to try and communicate with her and I will do my best and I will come back at 4:15 and we will go from there.

MADAM CHAIR: All right, thank you.

MR. CASSIDY: Thank you.

---Recess taken at 3:50 p.m.

--On resuming at 4:15 p.m.

MADAM CHAIR: Please be seated.

Mr. Cassidy, the Board has some questions they would like clarified. Would you like to just start with that as we usually do?

MR. CASSIDY: Yes, please.

MADAM CHAIR: On pages 150 -- well, actually on pages 76 and pages 152 and 153 you provide an estimated cost for chemical, manual, mechanical and burning treatments for jurisdictions other than Ontario.

Is the Board to assume that these costs are similar or comparable to the costs of these treatments in Ontario, and does Industry support the

cost estimates given by the Ministry of Natural Resources? In their evidence they gave us ranges of costs for these treatments.

We have a few questions with respect to Table 1 on page 93 and Table 2 on page 98. First of all, you state that herbicides have been used in Ontario forests for 30 years, yet you show zero use for 1980 in these tables. Are we to assume that there was no record of use before 1980 or that it was very small?

In Tables 1 and 2 we see large steady increases in herbicide use during the 1980s for site preparation and tending and we understand that a key factor in the increased use shown for tending in Table 2 was the authorization of glyphosate, but you also seem to be saying in your discussion of growth and yield studies that this research is very long term.

And are we to assume that the efficacy of herbicide treatments was not established or generally recognized by the Industry until the 1980s and that as a result an increased utilization of herbicide treatments has taken place?

In other words, we are trying to fix when Industry recognized that it was an important activity to be undertaken and when the research background was sufficiently convincing that it should be done,

something was going on with all of that during this period.

Also, are we to assume the growth trends we see in use will continue in the future?

MR. FREIDIN: Growth trends in the use of herbicides?

MADAM CHAIR: Yes, in terms of site preparation and the release and suppression of conifer.

We were curious about 1983 on Table 1, a very small amount of herbicide was used for site preparation.

MR. CASSIDY: Would that be '84?

MADAM CHAIR: That was '84, excuse me, 323 hectares were treated and we wondered if there was a simple explanation for that.

Also in Table 1, is it possible to obtain an approximation of the percentage of the area using herbicides for site preparation that was treated in combination with mechanical site preparation and prescribed burning?

We assume from the discussion that herbicides are not usually used in site preparation alone, that you make the point they are almost always combined with other preparation techniques. That's what we get from it anyway.

And another question with respect to the use of herbicides. Does Industry have an idea of the size of the area that they ideally would like to treat with herbicides versus the actual areas reported as treated in Tables 1 and 2; in other words, would Industry be treating much larger tracts of land than it is now and is the prohibition cost?

MR. CASSIDY: The prohibition against what they would like to treat versus what they did treat and is the prohibiting factor cost?

MADAM CHAIR: Yes.

MR. CASSIDY: I see.

MADAM CHAIR: We are assuming that Industry, given what we see in your growth and yield information, that you would like to treat much larger areas of land and why aren't you, and we assume it has to do with cost.

Our next set of questions has to do with the Industry's position on the registration and authorization of herbicides and insecticides.

On page 119 you mention the herbicide tryclopyr. Has this herbicide been registered as a forestry herbicide in Canada or is it in the process of being registered? You mention that it is in use in the United States.

MR. CASSIDY: Right.
MADAM CHAIR: We wondered if the application had been made to register it in Canada.
MR. CASSIDY: I think the witness statement states that it is not registered for use for timber management in Canada.
MADAM CHAIR: It is not registered for use, but we are interested to see if in fact there is some -- that there are some herbicides and pesticides now in the process where the application has been made for registration, we know that could take seven or eight years or whatever, and we are interested to know if in fact there is a backlog of herbicides and pesticides that are being looked at for registration. We got a bit of information on that from Dr. --
MR. CASSIDY: Ritter.
MADAM CHAIR: --Ritter.
MR. CASSIDY: So you want to know whether garlon --
MADAM CHAIR: Is in the process of being registered, yes.
MR. CASSIDY: And if so, at what stage?
MADAM CHAIR: Just if that's happening.
MR. CASSIDY: All right.
MADAM CHAIR: And also that applies to

the herbicides mentioned on page 160. There's Forestry Canada's experience with trying to assist in the registration of garvon and krenite. Is krenite also still -- are there attempts being made to register it as well?

Page 175. You list the chemical insecticides authorized for use in Canada but not permitted to be used in Ontario since 1985. The postion of Industry seems to be that even if these insecticides were allowed to be used in Ontario you believe they would be insufficient to control insects in the area of the undertaking.

We want to know if that's a correct interpretation of what you said; in other words, if you were allowed to use this list of pesticides in the area of the undertaking you would still not be satisfied that they could do the job, and that seemed to be what you were saying.

Page 107 - sorry I am skipping back and forth here - on page 107, the third point, in the last sentence you are making the statement that lower amounts of aerially sprayed herbicides achieve the same silvicultural efficacy as ground applications of higher amounts of active ingredient in larger spray volumes.

This is essentially -- what we are asking

for is a clarification of this statement which relates to Figure 2 on page 122 and somebody is just going to have to clarify for us slowly and carefully the technical reasons why that's the case.

On page 144 you express a concern that MNR's financial commitment of $300,000 annually for data collection and analysis regarding growth and yield data is inadequate. Is your Industry providing financial support to this type of research?

Page 155. You are asking the Board to accept the opinion of Forestry Canada that the lack of forestry herbicides contributes significantly to the backlog of non-productive forest land.

MR. CASSIDY: I'm sorry, that's page 145, Madam Chair.

MADAM CHAIR: 155.

MR. CASSIDY: Yes.

MADAM CHAIR: And we want a clarification of this statement because in the previous evidence the Board has heard we understand that there are a number of factors that might have resulted in unproductive forest land, including levels of silvicultural activity generally and we want to know how to assess that statement, that not being able to use forestry herbicides is more important or less important than

other evidence we have been given concerning these factors.

Oh, we had one last question and that was on page 209. You make it clear that you are asking the Board for approval of the termination that occurred in MNR policy of no chemical insecticides for forestry use, and we would like to receive your views of what would be the likely outcome if the Board were to approve the Class EA application with such a condition attached to it.

What effect do you think this would have on the, as you descibe it, political decision that the Ministry of Natural Resources has made for the past five years. We want to know the implications of a decision from a Board like ours.

MR. CASSIDY: In terms of the political...

MADAM CHAIR: In terms of the political aspects of whether -- would the Minister of Natural Resources be required in any way to comply with the condition if it were attached to our decision.

MR. CASSIDY: Okay. That may be a position that counsel may have to communicate to you as opposed to witnesses.

MADAM CHAIR: Yes.

MR. CASSIDY: So I will leave that to Ms. Cronk to determine which is the best position and just advise you of that.

I am not clear exactly, Madam Chair - and I apologize if I missed your point - about what conditions that you were suggesting that could potentially be proposed by the Board.

MADAM CHAIR: Well, it seems to us that you are asking for approval by the Board - perhaps it is the way it is stated - you are asking for approval by the Board of the termination of current Ontario government policy, essentially the no chemicals policy.

MR. CASSIDY: Oh, I see.

MADAM CHAIR: And the only way we would do that, if we were to approve the Class EA, would make that a condition of the Class EA, but it seems to us that there are some lengthy consequences of that and we want to hear your views about where that would take us and what the outcome would be.

MR. CASSIDY: All right.

MADAM CHAIR: And Ms. Cronk doesn't have to -- I understand that the panel members can't respond to that. She is free do that when she wants.

MR. CASSIDY: All right. Thank you.

MS. SEABORN: It may be, Madam Chair,

that that's an issue that other parties would want to respond to and I think it would be our preference to respond to that after we've heard all of the evidence in terms of the other intervenors that are likely going to be calling experts with respect to the same issues.

MADAM CHAIR: Yes.

MR. CASSIDY: Ms. Cronk will be made aware of this obviously, and I don't know whether she would adopt the same position as Ms. Seaborn in preferring to state our position on that at the end, or she may wish to do it in terms of this panel. So I mean, Ms. Seaborn's point is well taken.

MADAM CHAIR: Yes. At this point the Board is not -- you know, we are not looking behind what this recommendation is, we are simply saying that we are looking at the way that the Board's decision is structured and to what extent are the political decisions of a minister, what weight is given to the Board's decision and what effect does it have in terms of how it can change policies such as a no chemicals policy.

MR. CASSIDY: Thank you.

I have just one question of parties present, Madam Chair, if I may. Actually I had a question of counsel for Forests for Tomorrow who is not

here now.

But with respect to the statement of issues filed on behalf of the Ministry of the Environment, I wonder if counsel could assist me with respect to Section 2 of the statment of issues referring to OFIA/OLMA paragraph 5.3, the third point says:

"Can operational problems occur in the event chemical insecticides are aerially applied?"

And I was wondering if counsel could assist me with what type of operational problems they would like the witnesses to consider when dealing with that matter. Is there any particular type of problem that you have in mind that you want them to think about?

MS. SEABORN: I think what I would like to do is have a look at the exact wording in the witness statement. I believe there is some evidence, either in your witness statement or it may have been during MNR's evidence, that there can be certain operational problems involved with biological insecticides and I think the thrust of the questions were whether or not there can be the same operational difficulties, if one accepts there are difficulties,

with chemical insecticides.

MR. CASSIDY: Okay. Madam Chair, I had another question as I indicated for counsel for Forests for Tomorrow, but they are not here and we will pursue it outside the hearing if necessary.

The other matter I would like to raise is ask -- we have counsel for MOE and counsel for Forests for MNR present and, Ms. Devaul, and I was wondering if I could just get an indication from counsel present as to how long they might be in terms of cross-examination, and I regret that I was not aware that counsel for Forests for Tomorrow was not going to attend otherwise I would have asked, but we will try and determine that estimate from them in advance as well.

I should also indicate I have a statement of issues from the Anglers & Hunters and I am not aware how long they intend to be as well.

MADAM CHAIR: You can speak to Mr. Hanna tonight or tomorrow.

MR. CASSIDY: Yes.

MS. SEABORN: Have any other parties filed a statement of issues?

MR. CASSIDY: MOE, MNR, Forests for Tomorrow and the Anglers & Hunters are the parties I've

received statement of issues from.

MADAM CHAIR: And also NAN?

MR. CASSIDY: I don't have that.

MADAM CHAIR: I am sorry, I have it for Panel 7. Should we --

MR. CASSIDY: I could get an extra copy from Ms. Devaul later if that's your only one, Madam Chair.

MADAM CHAIR: Why don't you take this one, Mr. Cassidy. (handed)

MR. CASSIDY: All right, thank you. Then perhaps counsel present could assist me by providing estimates.

MADAM CHAIR: Mr. Freidin?

MR. FREIDIN: Three to four hours I think.

MS. SEABORN: I think probably two to three hours, Mr. Cassidy.

MR. CASSIDY: Thank you. I will take up the matter of estimates with the Nishnawbe-Aski Nation, the Anglers & Hunters and Forests for Tomorrow.

MADAM CHAIR: All right. And I understand that Mr. Castrilli will be cross-examining Panel 7.

MR. CASSIDY: Oh yes, thank you.

MR. FREIDIN: I think my estimate could change depending on the length of Mr. Castrilli's cross-examination and the detail with which we wants to go over the matter.

MR. CASSIDY: I think that will be the case for everybody.

MADAM CHAIR: Is there anything else?

(no response)

All right. Thank you very much. We will see you tomorrow morning.

MR. FREIDIN: Eight o'clock.

MADAM CHAIR: Eight o'clock.

---Where upon the hearing adjourned at 4:40 p.m., to be reconvened on Thursday, April 19th, 1990, commencing at 8:00 a.m.